EA-90-01

ENVIRONMENTAL ASSESSMENT BOARD

Ontario

ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 74

DATE: Thursday, October 17, 1991

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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EA-90-01

ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act, R.S.O. 1980, c. 140, as amended, and Regulations thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro consisting of a program in respect of activities associated with meeting future electricity requirements in Ontario.

Held on the 5th Floor, 2200 Yonge Street, Toronto, Ontario, on Thursday, the 17th day of October, 1991, commencing at 9:15 a.m.

VOLUME 74

B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
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MS. G. PATTERSON	Member

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L I S T of E X H I B I T S

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---On commencing at 9:15 a.m.

THE REGISTRAR: Please come to order. This hearing is now in session. Be seated, please.

MRS. FORMUSA: Good morning. Mr. Campbell has asked me to be here this morning as he will be a few moments late. He had a previous appointment.

THE CHAIRMAN: Thank you.

Mr. Watson?

MR. WATSON: Thank you, Mr. Chairman.

KEITH DOUGLAS BROWN,
PAUL FRANK VYROSTKO,
JOHN KENNETH SNELSON; Resumed.

CROSS-EXAMINATION BY MR. WATSON (cont'd):

Q. Panel, I would like you to turn to page 42 of Exhibit 340, please. I understand that the pulp and paper industry is the largest source of potential cogeneration sites in Ontario; is that correct?

MR. BROWN: A. Based on the Leighton and Kidd data, yes, that's correct.

Q. And that's the data that you rely on?

A. Yes. In terms of technical and attainable potential, yes.

Q. And in fact this interrogatory indicates that roughly half of the potential is in pulp

and paper.

A. Half of our 1,200 forecast comes from pulp and paper, yes.

Q. Mr. Brown, I was listening to the radio this morning and I heard that the pulp and paper industry is suffering some difficulties, is that your understanding as well?

A. They enjoyed some good times over the past and now they are in a tough period, that's correct.

Q. Is it fair to say that the difficult times that the pulp and paper industry is facing now may affect the development of cogeneration NUGs?

A. In the short term I think that's correct. I think it is a little early to judge the long-term potential.

Q. But it is a concern.

A. It is a concern right now.

Q. Have any pulp and paper mills identified in your steam data base closed since the time of the 1990 NUG plan?

A. I don't believe so.

Q. And, of course, if in fact you find out that some have closed, that your information is not up-to-date, you will let us know?

A. Every year when we produce the NUG plan we go through our entire list, updating the technical potential by removing sites that are retired or out of business and adding those that increase their potential.

Q. So we will see that in your 1991 plan?

A. If the information is available, that's correct.

Q. Can you tell us how many sites that are in your steam data base have a capacity factor greater than 70 per cent and are in the pulp and paper industry?

A. I think I could, I don't have that information with me.

Q. Could you give us an undertaking to that effect, please?

A. Actually, you would have it already in front of you. This 645 would be the ones in the top group.

Q. So, they are all 70 per cent or better?

A. That's correct.

Q. Okay.

THE CHAIRMAN: So all the pulp and paper

in excess of 70 per cent, is that what you are saying?

MR. BROWN: No, all the ones that are on Interrogatory 5.9.48, the 645 that's in our forecast, all of those are 70 per cent or greater. There would be others that are below 70 per cent.

THE CHAIRMAN: We better get 5.9.48 on the record then. No.?

THE REGISTRAR: That has previously been entered as 321.37.

THE CHAIRMAN: 321.37, thank you.

MR. WATSON: Q. Mr. Brown, do you know how many sites are involved with that 645 megawatts?

MR. BROWN: A. I can get you that at the break.

Q. Thank you. Mr. Brown, can you tell us whether a site which may not have a 20 year future would invest in cogeneration facilities?

A. I'm not aware of that. Our forecast as a cogen is a long-term business and we are looking at 30 year lives for cogeneration.

Q. So, if a site for any number of reasons didn't look as though it had a 20 year future, it's probably not a good site for cogen then?

A. Well, the rates of return are such that they are going to get their money back in five

years, but people that are investing in this business are making long-term decisions, and the experience to date is these facilities have been in for many years and not put in for five years and then taken it out.

Q. We talked about the problems in the pulp and paper industry, is it fair to say that a lot of them are due to the fact that the equipment is outdated and the industry in Canada is just having a tough time competing with that equipment?

A. I am not an expert in the industry, but their position I believe right now is the fact they don't have enough recycled paper and there is a lot of demands to use recycled paper to sell your product, and the Canadian market is a virgin wood market and that's there expertise. So, they are having trouble competing in this environment right now.

Q. And you need specialized equipment to compete in that environment, would you not?

A. They would have to get de-inking mills and other equipment to recycle the paper and mix it with their virgin wood.

Q. Mr. Vyrostko, I believe you testified at the OEB hearing with respect to companies withdrawing from NUG programs because a company's economic situation has changed. I believe you

indicated that you have had situations where that has occurred; is that fair?

MR. VYROSTKO: A. That's correct.

Q. I assume it is possible in the future that certain projects which currently have been established to be economic could also be withdrawn due to economics within the company which are unrelated to the specific NUG project economics; is that fair?

A. I think we can continue to see projects in the future that initially thought that they could go forward not going forward because of changing economic circumstances, yes.

Q. Has this possibility been accounted for in the NUG forecast, Mr. Brown?

MR. BROWN: A. This affects the timing of NUGs and when we look at our forecasts, we look at the economics and some will be in and some will be out.

Our cut-off is the 70 per cent level that was used in the 1990 plan. There is a possibility that others below the 70 per cent steam capacity factor are going through and others in the above not making it.

In terms of timing, over a 10 year period it's hard to say whether a project because of financial difficulties is -- the delay will impact on a NUG plan.

In the first years of the NUG plan we

used project data from proponents to tell us the timing. In the long term I used the Leighton and Kidd information because that's all we have. So, we try and incorporate as much information as we can in terms of timing from the proponents themselves. If they are seeing a delay in a project and we are aware of it, we incorporate that.

Q. No doubt the timing is a problem, Mr. Brown, and certainly would be an outcome of this scenario. Isn't it also fair to say that if in fact a particular industry or a particular operation closed, then you are into more than a timing effect?

A. Yes, and that would be -- I would be changing my forecast if that information was around.

Q. Mr. Snelson, I believe in your direct evidence you were talking about transmission constraints between the east and the west portion of the province. I understand from the 1990 NUG plan that there is a limitation of 250 megawatts for the northwest region which you expect to be filled by the year 1993. Is that still accurate?

A. That is a statement that I have in the NUG plan and that was based on information about a year ago. Mr. Snelson might be able to update that.

MR. SNELSON: A. The information we have

given in answer to an interrogatory is that there is room for approximately 100 megawatts more in the west system, and that's Interrogatory 5.14.221.

[9:26 a.m.]

THE REGISTRAR: That will be 321.49.

---<u>EXHIBIT NO. 321.49</u>: Interrogatory No. 5.14.221.

(Later deleted.)

MR. WATSON: Q. That's 100 megawatts in the west system, Mr. Snelson.

I understand the NUG plan at page 10 was talking about the amount of purchased non-utility generation that can be transmitted from the northwest region.

I assume that -- and they were talking about a 250 megawatt limit at that time. Is it fair to say that the fact that there is now a 100 megawatt limit decreases the amount of purchased generation that can be transmitted from that northwest region?

MR. SNELSON: A. I don't believe so. The 100 megawatts is in addition to what is already contracted, and the 250 megawatts would be against some lower base.

Q. Okay. Just dealing with the northwest region, my understanding is that in looking at the steam sites with steam capacity factors greater

than 70 per cent, five out of the 19 sites are in the northwest region.

Does that sound about right, Mr. Brown?

MR. BROWN: A. The information in interrogatories is 286 megawatts of the 1,435 is northwest region. I am not aware of the number of sites at this time.

DR. CONNELL: Could I just clarify for the record, I think we are using "west system" and "northwest region" synonymously. Is it correct to use them synonymously?

MR. SNELSON: Yes, it is correct to use them synonymously.

THE CHAIRMAN: That's a little confusing because in this list there is "central", "northwest", "northeastern", "eastern", "western" and "northwestern".

MR. SNELSON: Sorry. Maybe our terminology is a little confusing.

We think of our system as being two systems: the "west system", which is the northwest region and is loosely connected to the rest of the system, and the "east system".

We also have regions, and the northwest region has the same general boundaries as the west

system.

THE CHAIRMAN: So the western --

MR. SNELSON: The western region is southwestern Ontario, is--

THE CHAIRMAN: -- eastern system?

MR. SNELSON: --part of the east system. Maybe we should try and restrict ourselves to northwest region as being perhaps clearer.

THE CHAIRMAN: Well, it may not be so politically conscious if you would use north and south, I suppose. (laughter)

MR. SNELSON: Well, the north includes northeast region as well as northwest region.

MR. WATSON: Q. Looking at the same interrogatory, Mr. Brown, that's 5.9.48, as you have indicated, that gives a breakdown of potential by region.

Now, does this correspond exactly with the sites in the steam data base over the 70 per cent steam capacity factor?

MR. BROWN: A. No, it wouldn't. It's the same number of sites, the same sites themselves. It's just that if a project comes in above the estimated technical potential, this would reflect that.

Q. Mr. Brown, talking about the

geographic location of some of these sites, just assume for a second if all of the sites that are in Leighton and Kidd with a 70 per cent steam capacity or more were in one region, say the central region, would you still show the same breakdown by region that you have in this interrogatory?

A. If they're all in the central region then -- this breakdown is from the 70 per cent group.

Q. Yes?

A. So if the 70 per cent group is all central region, then it would be put in that category.

Q. Perhaps we will get to this in direct evidence, Mr. Brown, but it was my understanding that the 70-per-cent-plus sites in the northwest region provide more megawatt capacity than is shown in your interrogatories; is that not correct?

A. I will check into that. The information in 5.9.48 is what we are planning on and is our estimate of the attainable potential of the northwest region. I can check into these 19 sites you are referring to.

Another indication is on Table A1.3 in the 1990 NUG plan, page 20 provides a regional breakdown of the complete list and you will find northwest region represents 800 megawatts of the 6,400

in the remaining Leighton and Kidd information.

But that is a complete list that's shown on that table.

Q. What would happen with that achievable potential, Mr. Brown, in the northwest region if it could not be developed because of a transmission constraint? Would that simply be removed from your total of achievable potential?

A. In the 1990 NUG plan we estimated a total potential in the province and then estimated how much could be developed because of transmission in the northwest region. The difference was then moved to the rest of the system. It wasn't excluded.

Q. So you are saying there is a certain potential in the northwest region; if you can't realize it, it will be moved elsewhere?

A. Our assumption was that it would be developed in some other part of the province.

Q. What is the basis for that assumption?

A. The number that was calculated for the year 2000 did not look at transmission restrictions, so the 2,100 was just the number without transmission.

When we started doing regional breakdowns

we did not lower the 2,100 because of that, and I think to be fair you probably could have lowered it. I believe there is about 40 megawatts if we did it that way.

The 1991 NUG plan will not look at these transmission restrictions because it doesn't clearly identify where we are going to have problems, if I assume that NUGs will only go where transmission is available at the present time. This is a 25 year plan and it doesn't incorporate future changes in transmission.

Q. So if they aren't developed in the northwest for transmission reasons they would show up elsewhere.

Now, Mr. Brown, we were talking just a minute ago about the pulp and paper industry, and I think we agreed that if in fact an industry shut down it would be removed from the achievable potential; is that fair?

A. It would be removed from the technical and achievable.

Q. Yes. Now, isn't eliminating a site because it shuts down equivalent to saying it can't be developed because of transmission constraints?

A. No, that's not the same. When you

are shutting it down you are removing any potential of cogeneration because there is no steam host.

A transmission restriction may not be a long-term restriction eliminating development.

[9:38 a.m.]

Furthermore, there is no reason why the customer cannot produce a load displacement generator even though there is maybe a transmission generator because he is not selling anything to Ontario Hydro.

Q. Mr. Brown, you were mentioning load displacement. I guess it's fair to say then that it's only load displacement that could be put up in a situation such as that, for instance, because it probably wouldn't be cost-effective to put a transmission line in?

A. If it's a transmission problem, yes, that's correct, that is it is available now but as Mr. Snelson mentioned in his direct evidence, there are plans by Ontario Hydro now to alleviate some of these restrictions and may free up some of those bottlenecks.

Q. Mr. Snelson, perhaps you could turn to page 43 of Exhibit 34? That's a speech by Mr. Eliesen on September 11th. That's Exhibit 296 in these proceedings, page 4.

And if you look at the fifth paragraph

from the bottom, the paragraph that starts with the words, "As already mentioned...", you can see the last sentence in that paragraph talks about transmission limitation of 500 megawatts of new generation in the province west of the greater Toronto area.

Just to clear up any confusion we might be having, is Mr. Eliesen talking about the west system there?

MR. SNELSON: A. No, I don't believe so.

Q. Okay. Do you know what he's talking about?

A. I believe that he is referring to the limits on the additional generation in generally the southwestern Ontario area, which I described in my direct-evidence as being the limitation to the west of Metropolitan Toronto area that goes roughly from the Hamilton area up to Georgian Bay, so anything that was west of that line which includes southwestern Ontario but not northern Ontario.

Q. So, you're saying that includes the south, sorry, that includes the western region--

A. Yes.

Q --which is basically southwest of Toronto? And would it also include part of the central region as well?

A. I don't recall the precise boundary between central region and western region, so I would have to check on that.

Q. How does this 500 megawatts in the western region tie in with the 250 megawatts in the northeastern region? Is there any interaction between those two?

A. Sorry, which 250 megawatts in northeastern region were you referring to?

Q. The 250 megawatts that was mentioned in the '90 NUG plan that we were discussing earlier in the northwestern region.

A. Oh, northwestern region. I'm sorry.

They are substantially independent. I mean, everything in a transmission system is interrelated to some degree, but these are quite different parts of the system, so the inter-relationship would be quite small.

Q. Now are any of the 1,000 megawatts that we have been discussing expected to be committed by the end of the year in the western region Mr. Eliesen was referring to?

MR. BROWN: A. Of the southwestern Ontario western region ...

Q. Western region in the southwest part

of the province.

A. Of the rate offers that have been accepted by proponents for Ontario Hydro, zero megawatts have come from western region.

Q. And how about the northwestern region?

A. I'm sorry, it's zero for northwestern; it's 7 megawatts for western.

Q. So that leaves three regions. Could you just give us a breakdown of what's happening in the other three regions?

A. Northeast region is 785 megawatts; central region is 157 megawatts; eastern region is 526 megawatts, and that adds up to the 1475 that was in Exhibit 321.

Q. In looking at these projects --

A. Sorry, I meant 331, not 321. The 1475 is in Exhibit 331B.

Q. 331? Mr. Brown, in looking at these allocations in the five regions, are you close to or exceeding transmission capacities in any of these regions with these new projects?

Perhaps Mr. Snelson could help us on that.

MR. SNELSON: A. I'm afraid I can't help

you with that.

Q. Back to you Mr. Brown.

MR. BROWN: A. My understanding is obviously there's no change in the northwest region because there's zero megawatts there. The eastern system is fairly tight. There's some room in the right locations. Central region, there's lots of room. Western region, I believe, we had the limit in Mr. Eliesen's speech of over 500 megawatts. We still have that left. And the northeast region, depending on the location, there's room there too.

Q. Okay, so the eastern region is tight. Does that mean that...

THE CHAIRMAN: Excuse me. I understand this is interesting and relevant, but isn't it better answered in a later panel - transmission constraints? I think it's transmission constraints and NUGs' participation in them or, is a good line of questioning, but the details of these kinds of things probably would be more easily answered in Panel 7.

MR. WATSON: I'll pursue that there, Mr. Chairman.

THE CHAIRMAN: I think it's of some interest to know how the NUG program fits into transmission constraints. I think that's quite

pertinent.

MRS. FORMUSA: I can confirm Dr. Macedo on Panel 7 will definitely be able to deal with that.

[9:45 a.m.]

MR. WATSON: Q. Mr. Brown, looking at the 1989 NUG plan, the expected growth in capacity was 1,431 megawatts; is that fair?

THE CHAIRMAN: Where is that derived from?

MR. WATSON: That's from 1989 NUG plan, Figure 1 which is on page 45 of Exhibit 340.

MR. BROWN: 1,431 is correct and was developed by taking a difference of 1,635 megawatts of additions minus our estimate of retirement at that time of over 200 megawatts, the difference was 1,431.

THE CHAIRMAN: So what is the second figure, 1,635?

MR. BROWN: 1,635 was our estimate of new NUGs coming on and at that time we estimated retirements of older numbers of 17 megawatts per year, which by the year 2000 would be 204 megawatts.

THE CHAIRMAN: So what again is 1,431 figure?

MR. BROWN: That is the difference between the total number of additions minus the ones we

lose along the way. It's the net growth.

THE CHAIRMAN: Can this be keyed into Exhibit 331?

MR. BROWN: No, because this is 1989 NUG plan and the retirements have been changed.

THE CHAIRMAN: I see.

MR. WATSON: We will be getting into that, Mr. Chairman.

Q. So we are looking at the 1989 NUG plan here, Mr. Brown. I understand also that in 1989 the Ministry set a NUG target, Ministry of Energy set a NUG target of 2,000 megawatts by the year 2000; is that fair?

MR. BROWN: A. I believe in 1995 they said they wanted 1,000 megawatts and it should moving to 2,000 by the year 2000.

Q. And in fact we can see that reflected in the Ministry of Energy news release which is at pages 46 and 47 of Exhibit 340, in particular the second paragraph of page 47, which the Ministry has asked Hydro to double its target and that would be to 2,000 megawatts by the end of the century.

A. That's correct.

Q. If we are looking at 1990, switching from 1989 to 1990 now. If we are looking at the 1990

NUG plan, the forecast for NUG growth was 2,083 megawatts; is that fair?

A. That's correct.

THE CHAIRMAN: Where is that coming from? Sorry.

MR. BROWN: That is from the 1990 NUG plan, page 31.

MR. WATSON: Which is reproduced at page 48 of Exhibit 340.

THE CHAIRMAN: Hasn't that figure been revised? I am looking at 331, which I looked at for all these figures.

MR. WATSON: I am going to get to that, Mr. Chairman.

THE CHAIRMAN: This says 1990 forecast. Is there a different between the 1990 NUG plan and the 1990 forecast?

MR. BROWN: In the NUG plan we provide two numbers, one is the total number of new NUGs coming on line, that is 2,107, and that's in what is in Exhibit 331.

Within the plan itself we estimate how many NUGs they are going to retire over the life of the plan, that is not in Exhibit 331, but it is in the plan itself and will be in all future plans.

THE CHAIRMAN: All right.

MR. WATSON: Q. Just so that both of us are clear, Mr. Brown, what we have been talking about is the growth figure, and as you pointed out, that's the difference between the new NUGs that are put on the retirements that come off the system?

MR. BROWN: A. That's correct.

Q. So we looked at the '89 NUG plan which showed a figure of 1,431, we saw the Ministry target for 2,000, for the year 2000 was 2,000 megawatts in '89, and then we switched to 1990 and at page 48 of Exhibit 340 we saw that the NUG forecast was raised to 2,083 for NUG growth; is that fair?

A. That's correct.

Q. And it didn't escape my attention that 2,083 figure was very close to the target set by the Ministry.

A. It was close to 2,107 because we changed retirements. Our forecast did not incorporate the 2,000 target.

Q. Mr. Brown, the government filed an exhibit, that was Exhibit 249, dealing with the potential for energy conservation and CO(2) reduction in Ontario and I have reproduced page 36 of that exhibit on page 49 of Exhibit 340. If I could refer

you to the first paragraph on that page, they are talking about the reduction of electricity growth, and then in the second sentence they say, to supply this we project that non-utility generation would be increased to 3,300 megawatts, a 50 per cent increase from Hydro's current target of 2,100 megawatts.

My understanding is that report was filed in June of 1991. You would agree with me that shortly thereafter in September of 1991 your chairman, Mr. Eliesen announced an increase in the NUG target to 3,100 megawatts which is almost a 47 per cent increase.

A. He did announce 3,100, that's correct.

Q. Mr. Brown, perhaps you could help me out. We seem to have a pattern developing here.

A. Let me remove one myth. This is the first time I have seen page 36 and I am the one that started the calculation of 3,100, so obviously they are unrelated.

Going back to the '89 plan, there is no relation between what the government is forecasting and what Ontario Hydro is forecasting. They have targets, we have a forecast. And they are quite acceptable to be doing that. There is no correlation at all between the two numbers.

Q. It just happens that they seem to agree all the way along.

A. Maybe we are both using the same sources of information to do our planning.

Q. Well, you said yours was a forecast, now the government has referred to it as a target and you just indicated that of the government was referring to it as a target. Now, if you look at the next page, that's page 50 of Exhibit 340, your chairman seems to have the same opinion as the government. You will see that he is referring to it as a target throughout his speech. If you look at, for instance, the fifth paragraph from the bottom, the one that starts, "First the good news," you will see that he refers to it as a target there. The next paragraph, the third line, he refers to it as a target when he was talking about the earlier NUG plan. He then talks about a projection, in fairness, in the next paragraph, and then in the second last paragraph, the second line, he also refers to it as a target.

It seems certainly fair to say that both the Ministry and Hydro are referring to these figures that they are putting forward as targets.

A. In the past we have always used the word "forecast" for the NUG plan, and since the 1991

NUG plan has not been issued, the term "target" seemed to be appropriate at that time until the NUG plan was out, and when the 1991 NUG plan comes out we can now go back to a forecast.

The official forecast is still the 1990 NUG plan, 2,107. Until the 1991 NUG plan comes out, we don't have our new forecast yet.

Q. But in the fourth last paragraph Mr. Eliesen isn't talking about the 3,100, he is talking what has happened in the past, isn't he?

A. There is some confusion in this speech, that's correct.

We have tried in the past to always use the word "forecast", but because there are other parts of the corporation that have targets, the terms are used very loosely.

Q. Well, in fact, Mr. Vyrostko, didn't you tell us earlier that the compensation of senior people in the NUG department is tied to your performance?

MR. VYROSTKO: A. I said that performance of our senior staff is in fact determined by how well they achieve certain expectations.

Q. It seems to me that we could look at 3,100, in effect, as a sales target?

A. If that was the target, you might look at it like that. But I think we have stated a number of times here and elsewhere that the goal of our division is to go after maximum economic. There is no ceiling to that.

Q. Well, if your compensation is tied to performance, is it tied to a 3,100 figure?

A. First of all, in terms of compensation, there are probably about 14 or 15 different elements that each of the individuals would be monitored on. At most one would have to do with specific megawatts. So, I wouldn't think that the majority of a performance success in a given year is the 1 megawatt number.

Q. And the one that is tied to megawatts, is that tied to the 3,100?

A. No, it is just tied to the ability of us to achieve the forecast.

Q. Panel, I would like to you refer to Interrogatory 5.9.17, I believe I have provided the clerk with that.

Do you have that, Mr. Lucas.

---Off the record.

THE REGISTRAR: That will be 321.50.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.50: Interrogatory No. 5.9.17.

MR. WATSON: Q. Panel, that interrogatory talks about the competitive bidding process and it indicates that you have assumed that the open solicitation process as opposed to competitive bidding will continue. And, Mr. Vyrostko, as I understand your earlier evidence, that was to the same effect; is that correct?

MR. VYROSTKO: A. That's correct.

Q. Now, I was looking at a couple of things. If you could turn to page 64 of Exhibit 340, that's page 6 of Exhibit 319, your supplementary witness statement, the top paragraph says that policies on competitive bidding, among other things, are currently under development. Also, I believe that Mr. Eliesen in his speech referred to the fact that Hydro was planning on moving toward an competitive bidding process.

Can you help us with whether there is a contradiction there?

A. No. I think there is no contradiction. We are looking at moving towards competitive bidding at some point in time in the future.

We don't know when that will be. It will

depend on what the requirements are with respect to our system needs and it will depend on how well we can in fact negotiate the preferred NUGs that we are looking at now.

But in order to be able to make any move towards competitive bidding in the future, we have to do some work at the front end to understand the direction we want to take to start looking at some of the advantages or disadvantages of the bidding process. So, we are looking at sort of some of the successes in the United States and some of the processes they are following there to prepare ourselves for that eventuality.

Q. Will any of this be dealt with at the meeting on Friday, the meeting tomorrow?

A. I don't think so.

Q. Now, you mentioned you have to look at the front end, that's so you can get an understanding of where you are going, what direction and you are going to look at other experience.

[10:03 a.m.]

Isn't it fair to say that competitive bidding is going to give you a more focused direction than the past process of open solicitation which is anticipated to continue?

A. Typically what competitive bidding does is it allows for an organized approach to acquiring additional megawatts.

What it does, it allows a utility to identify the number of megawatts that they would want, timing for those megawatts, and then go after them in an organized way.

Our open solicitation process in essence did the same thing. The only difference was there was no capacity limit, so both competitive bidding and open solicitation is a way of proactively seeking out projects.

Q. Well, there is no doubt that they are both a way of seeking out projects, but isn't it fair to say that competitive bidding can better match resources with loads by requesting specific amounts and locations of resources?

A. It can do that. Open solicitation can as well if in our open solicitation we were to specify exactly where we wanted the projects.

The same thing could apply there. That's why I am saying as we move forward, as we look at the competitive bidding process, we really want to get all of the information we can to balance that off versus what we are doing today.

Q. We have been talking about sending out, I guess, signals to the NUG industry and getting information back, and your evidence is that just dealing with that issue you feel that certainly in the short term competitive bidding and open solicitation will give you the same information that you need and the same response from the profession; is that fair?

A. I didn't say that. I think open solicitation and competitive bidding is a way of communicating a need out there, whether -- and what the type of need is. You may elect to go to a competitive bid as opposed to open solicitation.

For instance, I believe that if there was a requirement for a limited amount of megawatts, let's say as an example 300 megawatts, you may want to use a bidding process to get at 300 to ensure that you are getting the most efficient projects meeting that 300 megawatts.

Q. Well, isn't it fair to say that with a bidding process NUGs have an incentive to keep their rate of return as low as possible and with an open solicitation process exactly the opposite incentive is there?

A. I would think that if the industry was mature and had experience in dealing with the

business then that would be a potential issue.

Q. Wasn't your direct evidence to the effect that the industry basically is mature?

A. Yes, we are now saying that the industry is reaching a mature stage. That is correct.

Q. And if Hydro had a competitive bidding process now NUG developers would have more incentive to keep their rate of return low in order to get their proposals accepted?

A. That is obviously what competition does. Yes, that's correct.

Q. Just one last point before we move on, Mr. Vyrostko.

You have indicated a couple of times that Hydro has a moratorium on selecting processes -- on selecting -- sorry, they have a moratorium on receiving projects from the NUG industry. I assume you have that moratorium because of the open solicitation process; isn't that fair?

A. No. Currently, why we have the moratorium is we are changing the rules in the way we are going to look at future projects, and rather than accepting or continuing to accept projects under the old rules we are just saying we are not going to accept them until we have been able to identify the new rules.

Q. Well, isn't it fair to say at least one of the reasons the rules are changing is because of this situation?

A. Which situation?

Q. What we have been talking about, the open solicitation, the fact that you have received so many bids, and if you had a competitive bid situation perhaps this wouldn't be occurring?

A. It's always, you know, easy to sort of look back and see whether the decision that was made is a right or wrong decision.

When we went with the open solicitation the industry was not developed at all, and so therefore, we felt that it was important that we allow projects to happen to allow the industry come in and prove whether in fact they can do the projects.

And now they are proving it, so now we are at the stage of saying, okay, the open solicitation has shown to us that there is an industry in Ontario that is willing and able to provide electricity to the system, and so now the question is: How do we now proceed in the future?

Q. I have no difficulty with that, Mr. Vyrostko. I guess the problem occurs with what our definition of "future" is.

From what you have said it would seem to me that what we would be looking at or what Hydro should be looking at is the competitive bidding process now as opposed to what you are saying in your interrogatories and in your direct evidence, that the open solicitation process will continue. It would seem to me, based on what you have just said, that the industry is maturing, that you want to go to the competitive bidding process.

A. Again, I think we have now changed the qualifications for projects, and these are projects that now are considered what we believe to be high efficiency cogen, and if we find that, for instance, we are being either swamped with projects or we are in fact not getting enough projects then we really have to evaluate the process by which we are soliciting the business.

I think the call that I am making right now is that I believe with the change in the approach that we are taking it is still appropriate to private solicit as much business as we can because these are important projects for us and I don't think that competitive bidding is the way to go at this time.

Q. Mr. Vyrostko -- I guess Mr. Brown perhaps, the Chairman was looking at Exhibit 331B.

Perhaps we could turn to page 50A of Exhibit 340.

The Chairman and the Members of the Board may have further questions. I just have one simple question for you.

I was looking at Column B and Column D, and in Column B you talk about a megawatt total and the number of projects. In Column D you just talk about a megawatt total and you don't have any number of projects.

Is it possible for you to provide us with the number of projects for Column D?

MR. BROWN: A. D is the same number of projects as B. All we did was -- C and D is split out of B.

Q. The first problem I saw -- I thought that might be it, but then I looked at B and I noticed for institutional and commercial and residential you have one project at 7 and zero at zero. I know that's a trivial example as there are obviously zero projects for zero megawatts, but your evidence is that all the rest of them are the same numbers for B?

THE CHAIRMAN: I don't think he means -- at least, I don't think he means that. Do you mean that?

MR. BROWN: No. C and D is a split of B.

It just so happens in the example you picked there is no overgeneration in that particular category, so that one project is full of high-efficiency cogeneration, so it's only going to be in C.

MR. WATSON: Q. Yes?

MR. BROWN: A. If we go to the industrial, there are six projects there. There are six in each side there. They are all above high efficiency.

Q. Yes?

A. The only other one left is gas compressor, and it is the same as industrial. It is all above. So it is all -- all two projects are in both C and D.

Q. So there are six projects composing the 707, two composing the 240? Okay. Thank you.

Now, the 1,000 megawatts that has been discussed before, you have indicated that a rate offer has been accepted, but --

THE CHAIRMAN: I'm sorry, which 1,000 megawatts are we talking about?

MR. WATSON: The extra 1,000 megawatts that increases the total from the 2,100 to the 3,100.

THE CHAIRMAN: All right. Thank you.

MR. WATSON: Q. Now, rate offers have

been accepted, but a contract hasn't been signed; is that correct?

MR. BROWN: A. That's correct.

Q. Does that mean it is still in the negotiating process?

A. That's correct.

Q. However, you expect them to be committed, which means the contract is signed by the end of the year?

A. Not all of them are expected to be signed by year end.

Q. For these situations where the developers have accepted rate offers, do all of them have natural gas contracts signed?

MR. VYROSTKO: A. Generally speaking, they would have gas contracts signed or they would have letters of intent committing the producer to the gas contract as agreed to.

Q. And if they have a gas contract signed or a letter of intent, based on your knowledge of the industry does that mean that there is pipeline capacity available to meet the gas requirements?

A. Generally, those projects, because they are looking at in-service dates of anywhere from '94 to the end of '95, would have been in the queue and

would have identified their project within the required three year lead time with TransCanada PipeLines.

Q. Now, based on your experience, would you agree that industrial gas contracts such as this contain provisions for firm gas and transportation?

A. You are saying that they contain transportation elements and firm gas portions within the gas contract?

Q. Yes.

A. Typically they would have that.

Q. If we could just move to the winter peak for a minute, if we could. Assume an abnormally cold year. Isn't it possible that these customers could be interrupted?

A. That I am not aware of.

Q. Are you aware of whether there is a hierarchy where gas is supplied to residential loads in priority over industrial or other loads?

A. I understand that there is a priority of customers within the gas system.

Q. And if in fact there is a hierarchy and the industrial customers are not as high as the residential customers it is possible that the industrial customers could be interrupted under certain circumstances?

A. Again, I don't know what the contracts specifically would say for each of those projects. The contract that we would have with them is that they would provide electricity throughout the entire period.

Q. Well, let's just have a hypothetical for a second. Let's assume that something happens, gas is interrupted in the winter peak. Are they going to be able to generate power?

A. If gas was interrupted to them they couldn't generate electricity.

Q. These 1,000 megawatts, they are not expected to be dispatchable; is that correct?

A. I believe most of the projects have curtailment clauses within a contract.

Q. But they are not dispatchable?

A. Curtailment is limited dispatchability.

Q. Okay. It's one side of the coin? Curtailment means that you can, in effect, shut a NUG down or not use the NUG power, not buy it, but that doesn't mean it is there when you need it; is that fair?

A. On the basis of the way the contract is negotiated and the delivery is negotiated by the

proponent, then the expectation would be that the proponent meets his delivery pattern. That delivery pattern typically would reflect the importance of being on our peak throughout the year.

Q. I know that's your expectation and I'm sure it is a NUG producer's expectation because they will get paid for the power they produce.

But to reduce it to very simple terms, you can turn on a switch and get power from a Hydro facility, and that is in effect dispatchability.

[10:20 a.m.]

You can't necessarily turn on a switch and get the power from a NUG, however you can turn off a switch and take a NUG out of a system and that's curtailment, and that's the difference between the two; isn't that fair?

A. When we look at projects, even going back to the Hydro system, I think there are projects that we look at as being base load operations and there are others that we look at something other than base load. A base load plan typically would be the latter example that you used. The switch would normally be on and you would only turn it off when in fact it's not necessary, and typically that's how we see most of these NUGs. That currently they are base load and so

therefore they would always be on and we would turn them off when we didn't need them.

Q. I don't want to make too much of this, but you are talking expectations, that's what you hope. The point is the control doesn't rest with Hydro.

A. The control does not rest with Hydro, that's correct.

Q. Now, you were talking in your evidence earlier about curtailment and you said that that would occur especially when nuclear was on the margin; is that a fair summary of your evidence?

A. I'm not sure if I said that. I believe what I said was that curtailment occurs when power isn't required and that's typically in the summer time off-peak.

Q. Mr. Vyrostko, if you could look at Volume 72 of the transcript, please.

A. Yes.

Q. It's page 1370. The second full paragraph starting with the words, "Now we often," and continues.

"Now, we often have in our non-utility generation contracts a clause that does allow some curtailment during hours of

surplus base load generation. That is when hydraulic generation or nuclear generation is the marginal fuel. And so we do have some limited contractual ability to cut back in these circumstances."

So, we are talking about curtailment when nuclear is on the margin.

MR. SNELSON: A. I believe that was my reply, Mr. Watson.

Q. Okay.

A. And surface base load generation is when nuclear and hydraulic capacity available and any other low cost generation exceeds the load. And in those circumstances, our usual choice is to cut back on the nuclear generation.

Q. Okay. Now, does curtailment apply to all NUGs?

MR. VYROSTKO: A. No, it does not.

Q. Is there something that explains to us when curtailment applies and when it doesn't?

A. Curtailment is one of the options that we have been trying to negotiate with developers to get some form of dispatch into the contracts. So, recently, I would say within the last year, as we have

been negotiating projects, we have been asking for some forms of curtailment and we have been successful in getting that in our recent contracts.

Q. So this isn't a Hydro policy, it's one of the items that you negotiate?

A. It's not Hydro policy, but it's a desire from a system perspective to have dispatch for operating flexibility and we are now trying to get that through our contracts.

Q. Okay. I assume as this is in the negotiation process, there must be some compensation or some other benefit if NUGs agree to be curtailed?

A. NUG projects, NUG contracts have value to us, have more value to us if they in fact can be dispatched or curtailed, and so we try to get that into our contract.

Q. And if you try and get it into the contract, then you would reflect that in some benefit or some way to the NUG developer?

A. In some cases the way we would reflect that is in negotiating and concluding with the contract. By having some flexibility in it, in overall operation, then that project can come in within our avoided cost.

Q. It would seem to me that curtailment

is important from a system point of view. How do you determine which unit should get curtailed and which should not? Isn't it a function of where they are in the system, the size, what type of NUG they are, aren't all of those things important from a system point of view?

MR. SNELSON: A. From a system point of view, Mr. Watson, there are requirements for security and safety purposes, which are covered in contracts. i.e., if the operation of a non-utility generator were to endanger the employees or public, or were to endanger the reliability of the system, then in all NUG contracts we have the ability to cut back under circumstances and that is separate from the curtailment. The curtailment is the ability to do it for essentially an economic reason.

Q. You are talking about economic reasons, Mr. Snelson, is heat rate reflected in that?

A. Can you be more specific?

Q. Well, simply if you have a lower heat rate, are you more likely to not be curtailed? If you are lower heat rate you are more efficient, hopefully better for the system and the province as a whole, therefore you should be on and others which have a higher heat rate should not be. Is that one of the

criteria?

A. I believe the limitation on curtailment contractually is with respect to the number of hours per year that they can be curtailed.

Q. Can you give us some idea of what are the hours?

MR. VYROSTKO: A. We have contracts in the order of 600 hours.

Q. Is that 600 hours at any time or is it 600 hours in certain seasons?

A. It's typically 600 hours during the summer period.

Q. Is that a maximum figure?

A. It's a negotiated figure.

Q. We are talking about nuclear being on the margin, and I reproduced some excerpts from the DSP on pages 51 and 52. Mr. Snelson, you are very familiar with the chart on page 52, you referred to it many times. In effect it shows that nuclear is on the margin 11 per cent of the time in the year 2000 and that's reflected at page 51.

Now, Mr. Vyrostko, you are saying 600 hours in the summertime, if nuclear is on the margin 11 per cent of the time, that amounts to just roughly about 900 hours.

Do you think NUGs would agree to a level of curtailment like that?

A. Again, we are trying to develop a guideline for curtailment or dispatch with NUGs and trying to in fact develop a reflection of the economic value that dispatch or curtailment has to us, and that we try to work with each proponent as we negotiate contracts.

Q. Do you have a contract with 900 hours in it, curtailment?

A. Specifically for curtailment, no.

But just one other element in the contract, that typically we discuss with the generators as to planned outages and we try to plan them with our own system.

Typically the planned outage would occur in the summertime as well, and so when you add the planned outage and the 600 hours of curtailment, you could be approaching 900.

Q. Mr. Brown, is curtailment accounted for in the cogeneration feasibility model?

MR. BROWN: A. Not in the feasibility model. It's included in the calculation of the energy contribution from NUGs.

Q. Now, we have had some discussion

about committed projects. Assuming these thousand megawatts of projects are committed in the near future, I know that not all of them will be this year but in the near future, is it fair to say there is still a number of permits, licences and reviews that are required before the plant can be built?

MR. VYROSTKO: A. That's correct.

Q. Do you have a report or an interrogatory or anything which lists all of the reviews that a NUG has to go through?

A. There are a number of interrogatories that we have provided that talk about some of the permits and licences that are required. As an example, Interrogatory 5.4.1, which I believe attached our request for proposal, in that request for proposal document it identifies a number of permits and licences that we believe the proponents would have to consider as they submit their proposed projects.

THE REGISTRAR: Could I have that number again, please?

MR. VYROSTKO: 5.4.1.

THE REGISTRAR: That will be 321.51.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.51: Interrogatory No. 5.4.1.

MR. WATSON: Q. Mr. Vyrostko, you used

the word "some", do you mean that that is not a complete list, there may be other things that are not on that list?

MR. VYROSTKO: A. Our responsibility is not to try to identify necessarily the entire listing of requirements.

What we try to do is assist the proponent in directing them to the appropriate ministry for proper identification of all the permits and licences.

Q. No, I wasn't suggesting it was your responsibility. I just wondered if you had something that we could look at. 5.4.1 is as close as you have?

A. That's pretty well the list that we have, correct.

Q. Now, I suppose it's always possible that projects facing these lists of licensing or permitting requirements could run into difficulties?

A. That's a possibility, yes.

Q. I suppose the range of options are they could either stop the projects or slow their development, and if they did the latter, it would certainly increase the cost to the developer; is that fair?

A. That's correct.

Q. We know that environmental issues are

becoming a much larger concern to the province than they have been in the past. Isn't this also a situation where we could increase the likelihood that certain committed NUG projects would face problems?

A. There could be the possibility where some of the committed projects could run into problems.

Q. Doesn't this particularly apply to the major supply NUGs?

A. I can't make a judgment as to whether it applies there more than anywhere else.

Q. Mr. Vyrostko, in the RFP process, I assume Hydro did not set out to encourage MS NUGs, major supply NUGs; is that fair?

A. I think when we initiated the request for proposal, we were looking at any non-utility generator that was economic and that could in fact didn't meet all the requirements.

[10:35 a.m.]

Q. I assume it's undesirable for Hydro to accept an unlimited number of major supply NUGs, is that correct?

THE CHAIRMAN: Did you say "undesirable"? Is that what you said?

MR. WATSON: Yes.

MR. SNELSON: Essentially the amount of

generation we need is determined by system requirements, and so that would put a limitation at some point on the amount of major supply NUGs that we need.

MR. WATSON: Q. I also understand certainly one of the purposes of RFP No. 1 was to encourage the development of renewable resources and cogeneration, isn't that fair?

MR. VYROSTKO: A. Again, I believe it was intending to try to encourage all forms of non-utility generation to stimulate the industry.

Q. Which would include renewable resources and cogeneration?

A. It would include those as well.

Q. And, in effect, that just didn't happen, did it?

A. In terms of the renewables, we didn't get as many proposals as possibly some people would have thought, but I think our results show that more than half of the request for proposals, proponents were putting projects in that were cogeneration.

Q. But a lot of those would be oversized cogen?

A. As it turned out they were larger cogen opportunities. That's correct.

Q. And it's probably fair to say that an oversized cogen unit is virtually the same as a major supply NUG, isn't it? Certainly the oversized part?

A. We are looking at and we have said that our preference is for those projects that are thermally balanced or high-efficiency cogen. And so if there was a categorization of the type of projects that we would today want, the high-efficiency cogen would be preferred over the other type of cogeneration.

Q. Panel, if we could just look at a combined-cycle plant for a minute.

Now a combined-cycle plant built as an MS NUG would be the same as one built by Hydro, is that fair?

MR. SNELSON: A. In general principle, yes, the detailed selection of size or equipment might be different. In general principle, yes.

Q. Well, both would face the same natural gas prices, isn't that fair, or could Hydro negotiate a better deal because of its size?

A. I couldn't comment on what differences there might be in terms of our ability to negotiate gas contracts.

Q. What about the ability to purchase equipment? Is it fair to say that Hydro could get at

least the same rate as a private developer, if not better?

A. I couldn't comment on that either.

Q. I assume both would create the same emission levels, the same needs for transmission?

A. The needs for transmission will be dependent upon location and given the same location they would have the same effect on transmission, same location and size.

The other part of the question? There were three parts, I think.

Q. The emissions levels. They would be the same for the same plant, I assume?

A. If the same control measures were used you would expect them to be the same.

Q. And they may because of Hydro's position and the current state of the law, the Hydro emissions could be less, isn't that fair?

A. I don't think we have any particular evidence of that.

Q. Of course another difference would be that there would be a rate of return paid to a NUG developer, but that wouldn't apply in the Hydro case?

A. The financial arrangements would be different.

Q. Yes. Also Hydro would have control over dispatching the project, but it wouldn't have control over a NUG project?

A. It would have control over the dispatch of the project subject to whatever terms and conditions, whatever constraints were put on dispatching from the fuel contract.

Q. It wouldn't have the same dispatchability that it would have over it's own plant?

A. I'm sorry?

Q. It wouldn't have the same dispatchability for a major supply NUG that it would have for its own plant?

A. One would expect the dispatchability to be at least as good from the Ontario Hydro plant as from the major supply NUG, but there may be constraints on dispatching of the Hydro plant if it was necessary to enter into some sort of fuel contract.

Q. Well, we were talking earlier about dispatchabilities, Mr. Snelson. I mean, you're assuming that NUGs are non-dispatchable. You don't make that assumption on your plants, isn't that correct?

A. That is not normally the case but, for instance, we use natural gas in the Hearn

Generating Station in the 1970s, and the terms of the gas contract required us to take increased volumes in the summer compared to the winter because that was what suited the gas system, and so the terms of the fuel contract can affect the dispatching of the electricity.

Q. No doubt about that, Mr. Snelson. You're not going to argue with me that that same restriction would apply to a NUG, and if anyone is going to be able to negotiate with the gas people, I assume you would be able to do it as well as NUG developers, if not better, so the situation that you're talking about in the 70s, in fact, may not apply today?

A. I'm sure the situation today is different, but my only point is that the, to get commitments of gas for a generating plant, it may be necessary to guarantee that certain volumes of gas are taken, and may be taken in certain time periods, and that would constrain the dispatch of a plant whether it was owned by Ontario Hydro or by a non-utility generator, but I do agree that the dispatch of an Ontario Hydro plant would be at least as flexible as the non-utility generating plant.

Q. I assume Hydro does not have any control over outside conditions which would cause a NUG project to be abandoned in the future?

A. I'm sorry, I don't...

Q. Such as economic conditions, things like that? A NUG project may have to be abandoned in the future for any number reasons, and Hydro would have no control over that?

MR. VYROSTKO: A. There are situations where if a project were to be abandoned in the private sector our contract would say that we would have rights to the plant, so there are some cases where we have been able to negotiate that.

Q. If you had rights to the plant, especially with something like a cogeneration plant, you might be in a position where it would be probably more expensive for you to run that plant than the NUG developers, isn't that fair?

A. I couldn't make that judgment.

Q. Okay. Is it fair to say that Hydro projects are at least reliable or more so than the major supply projects?

A. I would think it depends on the circumstance and on the actual project itself. There's utility projects that are more reliable. There are non-utility generation projects that are more reliable so it depends on the particular circumstance and the station.

Q. Mr. Vyrostko, I believe your evidence was that Hydro is better suited to building bigger projects, and the NUG developers have a niche in dealing with the small projects. Is that a fair summary?

A. As long as we qualify what "large" and "small" means, yes, that's a fair assumption.

Q. That's precisely what I wanted to do, Mr. Vyrostko.

If you look at page 53 of Exhibit 340, we have page 14-19 of Exhibit 3, and if you look at the bottom of the middle column they're talking about the configuration of units, and the second and third refer to a 150 megawatt CTU and a 660 megawatt combined cycle and integrated gasification combined-cycle unit. Then if you look over at the left-hand column, in the last paragraph just above the heading, "System Application", and the paragraph that starts, "For optimal integration...", the second sentence they're talking about for Option 6, 7, 8, and 9, the first phase of each 660 megawatt unit comprises three 150 megawatts CTUs, and the second phase comprises one 210 megawatt heat recovery steam generator, so we see we have a number of 150 megawatt CTUs that Hydro is interested in, and we know from what Hydro is seeking in its plan

approvals that combined cycle, IGCC and CTUs play an important part of the plan, is that fair?

A. Yes, that is fair.

Q. So 150 megawatts CTU units also play an important part in the plan?

A. That is correct.

Q. Now, if Hydro was contemplating building a number of these 150 megawatt CTUs, then dealing with Mr. Vyrostko's question, it would seem to me that 150 megawatt unit is something that Hydro feels comfortable doing, and if that's the situation, why shouldn't Hydro be making the units that are above 150 megawatts, and the precise example is the 350 megawatt and the major supply note.

MR. BROWN: A. Just to start with we're using different terminology here. The 150 is only one part of the station. It is one unit in the station of 660 megawatts. In a NUG of 350 or 250 there may be CTUs that could be 50/60 megawatt sizes and not 150 megawatt sizes, so there still is a size differential that with we have seen to date in projects. The 350 megawatt major supply NUG isn't one unit at 350 megawatts.

Q. No, I'm aware of that, Mr. Brown, and in the same way you're,...

A. Is not. Probably 4 or 5 units.

Q. Okay, in the same way that your 660 megawatt combined-cycle plant isn't a 660 megawatt unit. It is composed of a number of 150 megawatt units. So do I take it your evidence is that the 350 megawatt unit does not have any CTUs that are near the 150 mark?

A. I can't get into the project design. In general, the NUGs are using smaller CTUs than as proposed by Hydro.

Q. Is it fair to say then, and I appreciate that you don't want to get into the specific project design, but is it fair to say that if a proposal came forth in the 150 megawatt range, that that is something Hydro would consider building as opposed to something that should be left to the private sector?

MR. SNELSON: A. I think the thrust of our direct evidence is that where you are into a major supply NUG, and this is in the future, in the future when you're into major supply NUGs which would use combined-cycle technology, or combustion turbine units similar to the technology that Ontario Hydro would use, and size is not the sole criterion here, that the process we're intending to follow is to determine what

our need is for that sort of technology, and then see about what is the best way of implementing that. So we're leaving the question open in this process as to whether future combined cycle type of plants should be built by Ontario Hydro or by a non-utility generator, and I don't think we have settled exactly how that process will be resolved.

[10:50 a.m.]

THE CHAIRMAN: But you have never done this before, anything like this before?

MR. SNELSON: We have, as we have said, taken on a non-utility generator that is a major supply NUG in the 350 megawatt project that's been discussed.

We have not previously gone through a process of trying to -- and having said that we need that sort of technology, of trying to decide who should do it, Ontario Hydro or the non-utility generator.

THE CHAIRMAN: But historically in deciding who would do it, there was no question that Hydro would do it.

Now, there is a new policy or attitude, whatever you want to call it, that you would consider whether Hydro does it or whether you arrange for somebody else to do it.

MR. SNELSON: That is correct.

THE CHAIRMAN: I take it there is no limit on that. Conceivably it could be a very large plant?

MR. SNELSON: Yes, I believe there is no particular limit on that.

I think there are also degrees of private sector involvement in that it is possible, for instance, to have the private sector design and construct a plant to a general specification by Ontario Hydro and then Ontario Hydro would just buy it as a finished and working plant. That's called a turnkey project.

THE CHAIRMAN: You have done that before?

MR. SNELSON: That's been done. So there are a variety of sort of arrangements that can be introduced.

MR. WATSON: Q. Mr. Snelson, as you can appreciate, my client is quite interested in this. Can you give us some idea of when Hydro is going to have a policy on this, what criteria are going to be included in this policy, what stage you are at in developing this process?

MR. SNELSON: A. I think we are at a very early stage in developing this process.

The stage we are at is that we have

recognized that because of the parallel nature of these sorts of technologies between what the private industry can do and what Ontario Hydro can do that we need to co-ordinate the planning better, that the planning needs to recognize that when you have an electricity-only generating plant then it should be designed and operated in step with the electricity system requirements, whereas when you come to the dual-purpose plants, like the cogeneration plants and waste-burning plants, the design and the operation is as much determined by the other use of that facility as it is by the electricity system.

So we do need in these -- of course, we recognize that we need to have better co-ordination of planning, better co-ordination of operation, and better definition of dispatchability for this type of facility, but we haven't as yet gone very far in the direction of defining exactly how to do that.

Q. Now, Mr. Snelson, for all of those very important reasons that you have mentioned wouldn't it be fair to suggest that Ontario Hydro should refuse these major new supply NUGs, especially, as the Chairman said, that they could be of any value -- any amount, until you have this policy in place, until you have the criteria, so that you can ensure that there

are no problems with the system, some of which you have identified?

MR. VYROSTKO: A. I believe that's the position that we have actually taken now with respect to the changing approach to our business, that we are now trying to encourage only the preferred NUGs and renewables in the future.

Q. I understand what you are trying to encourage. My question was a little bit more focused, though.

I was suggesting that perhaps Ontario Hydro should now refuse to have any more of these projects until this very important policy with its accompanying criteria is in place.

A. You mean preferred NUGs?

Q. No, I mean major supply NUGs.

A. I think the way our business is going forward with the redefinition, we probably won't see any major supply NUGs in the near future, and that as previously stated if there is a system requirement in the future for additional supply, then by then we should have enough information and we should have our -- the guidelines identified such that we can then go out in an organized way to acquire major supply, if that were to be the case.

Q. I understand that, Mr. Vyrostko, that is your expectation, but I guess what you are telling me is that you cannot assure my client that these projects will not go on the system until that policy and its criteria are in place.

A. Perhaps we can talk about that after we have made our announcement to the proponents tomorrow on what the guidelines are because I would suspect that some of that information would, I think, give your client some reassurance that they won't come on stream.

Q. Thank you, Mr. Vyrostko. I have added that to my "after Friday" list.

THE CHAIRMAN: Would you like to break now?

MR. WATSON: This would be an appropriate time, Mr. Chairman. I can tell you that I am progressing faster than I thought I was going to progress. I am sure we will be finished today well before four o'clock.

THE CHAIRMAN: Thank you. We will adjourn now for 15 minutes.

THE REGISTRAR: This hearing will adjourn now for 15 minutes.

---Recess at 10:56 a.m.

---On resuming at 11:15 a.m.

THE REGISTRAR: This hearing is again in session. Please be seated.

Mr. Chairman, Interrogatory 5.14.221, I note, has previously been entered and given the number 321.26. I inadvertently, earlier this morning, gave it another number, 321.49. As we have gone beyond 49 to 321.51, with your permission I would like to hold 49 vacant for the next interrogatory to come up.

THE CHAIRMAN: That will be fine. Actually, in the listing, the printed listing, it is shown, 26, as 5.4.221, and that was perhaps why that occurred.

THE REGISTRAR: I regret the error.

THE CHAIRMAN: I should also take the opportunity to just note for the record three exhibits that have been filed all by the Board.

The first is Exhibit 337, which is the summary of the site visit to the Moose River/James Bay area to Kapuskasing, which occurred in the early part of September.

Exhibit 338 are the written submissions that were made to the Panel during those site visits, and Exhibit No. 339 is a petition that was presented to the Panel at Moose Factory during those site visits.

---EXHIBIT NO. 337: Summary of site visit to Moose River/James Bay area to Kapuskasing, in early September.

---EXHIBIT NO. 338: Written submissions to the Panel during site visit of Exhibit 337.

---EXHIBIT NO. 339: Petition which had been presented to Panel during site visit of Exhibit 337.

THE CHAIRMAN: So those are put on the record.

And now, Mr. Watson?

MR. WATSON: Thank you, Mr. Chairman.

Q. Before moving on, I would like to clear up one matter.

We were talking about the 1,000 megawatts, and I believe your evidence was that you did not think all of the contracts would be signed by the end of this year; is that correct?

MR. BROWN: A. All the rate offers, that's correct.

Q. Hydro's definition of "committed projects" is when the contract is signed?

A. That's one way it can be committed.

Q. I guess where my concern arises is if -- and I don't have the copy of this. It is Exhibit 319, which is the supplementary witness statement, paragraph 7, and I will read paragraph 7 as it is

short:

Currently the NUG industry has 73 committed and in-service projects, totalling 718 megawatts of electricity generation, with an additional 1,000 megawatts expected to be committed by the end of this year.

When I saw the word "committed" I remembered the earlier evidence and I thought "committed" meant "signed contracts". Is there something I am missing, Mr. Brown?

A. No, we expect to get a 1,000 megawatts of contracts signed by the end of the year.

What is a little bit confusing is there are projects already in the committed list in the 718 that haven't got a signed contract. They have been committed for other reasons, as I mentioned. Signing a contract is only one reason why we would commit a project.

Q. So for those projects which are committed which don't have contracts you are still in the negotiation phase with these developers?

A. It is still under negotiation and they are still getting required approvals.

THE CHAIRMAN: Just so I understand it,

in what circumstances would you regard an arrangement to be committed when there was no signed contract?

MR. BROWN: If the developer has committed to the project with a large financial commitment, such as he has ordered his equipment or started construction or started a draw down on his financing, then we would now call it a committed project.

MR. WATSON: Q. Now, Mr. Brown, how many of those "committed but no contract" situations exist? Can you give us a rough idea of the number of megawatts?

MR. BROWN: A. Roughly about 200 megawatts.

Q. I would assume that if a developer is committing resources is it fair to say that is probably a cogeneration project?

A. It could be small hydro.

MR. WATSON: Mr. Chairman, Members of the Board, I had a number of questions I was going to pursue on another aspect of avoided cost, in particular project appraisal, system incremental costs, and how they fit in in other areas.

Based on the evidence that the Panel gave yesterday I also will include that in my "after Friday"

list and come back in re-cross-examination and deal with that, depending on what happens on Friday.

Q. Now, Panel, if you would look at page 55 of Exhibit 340 we again have an excerpt from Exhibit 319, and if you would look at the bottom paragraph, paragraph 27, that talks about the surplus, and you indicate that there would be a surplus for a few years around the year 2000.

Is it fair to say that part of that surplus is going to exist before the year 2000?

MR. SNELSON: A. To some degree, yes.

Q. And is it fair to say that one of the concerns about NUGs is that they create a less than optimal resource mix?

A. In what sense were you using the word "optimal"? I'm sorry, I am going to need that clarification to be able to answer the question.

Q. Well, I didn't think it was going to be a difficult question.

Perhaps you could turn the page to page 56 of Exhibit 340. Paragraph 5, the last line, refers to some NUG disadvantages -- the last sentence refers to some NUG disadvantages in the last line. It says:

> Less flexible operation and less optimal long-term resource mix.

A. I think that one of the concerns that is being discussed in that particular paragraph is that we are concerned that we have a reasonable balance of different sorts of energy sources on the system from both an economic point of view and also from a sort of resource use and diversity point of view.

And with a forecast of rising real natural gas prices, then we are concerned about the degree of dependence that we may generate on natural gas if we go to very large quantities of natural gas-fired generation, and NUGs are currently offering a lot of natural gas-fired generation.

Q. Most of it is; isn't that fair?

A. Except for the waste and small hydro, yes.

Q. And they're a very small component?

A. They're quite small.

Q. Is it fair to say that NUGs don't necessarily meet the supply requirements in terms of both energy and demand?

A. NUGs generally operate according to the contractual terms that we negotiate with them, and we try to get some match between the supply requirements and the terms we negotiate.

Q. Mr. Vyrostko, when you were

discussing negotiations earlier you indicated that Hydro is taking a risk on natural gas price escalation factors. You also indicated that this could be reflected in the purchase price which was offered to NUGs.

First of all, is that a fair summary of your evidence?

MR. VYROSTKO: A. Yes, we have taken gas price risks.

Q. Okay. Could you please explain to us precisely how you factor this risk into the purchase price? Are there any criteria? Is there any policy?

A. Basically, what we do is negotiate the project such that if we were to take gas price risks, the opportunity and the cost of that gas price risk is offset by an equal gas price benefit to the ratepayers, and so anytime we take on a risk it is always matched with an offsetting benefit that we can earn.

Q. Looking at the general concept of risk isn't it fair to say that increasing risk usually commands some sort of increasing return or increasing benefit, and wouldn't that be appropriate in this type of situation?

[11:30 a.m.]

A. Again, if we are taking on risks we would then be expecting the appropriate or offsetting benefits.

Q. So can you be that precise in your negotiations that you say that if you identified this area of risk, you can match a corresponding benefit to that risk?

A. Typically, the risk in the contract is on the long-term price of gas.

In the early stages, a year ago, when we were negotiating with proponents, there was a concern that the price of gas would escalate faster than other forecast and other people's expectations. Therefore, to try to have cover off that uncertainty with the developer, what we basically said is we would be prepared to consider reopeners in the gas contract such that if there were to be this expected high price increase, some of the increase would be picked up by us. It's a shared risk between ourselves and the developer.

In all cases there would be a cap that would be discussed, so it's not unlimited; there is a cap set to that. And then the overall measurement of the project is the project avoided cost.

Q. Okay, Mr. Vyrostko, you were

mentioning that a year ago there was concern about the gas price forecast. We have heard a lot so far about the low prices of gas today. Is it fair to say that that concern is no longer there?

A. In the latest contracts that we have been seeing that is not there. The gas industry is prepared to go with fixed price escalation without any concern for these reopeners, that's correct.

Q. So Hydro is not taking risks on current contracts?

A. Again, the trend now is that we can get gas without taking any of the price reopener risks. To say that there isn't any risk being taken, it depends on the contract specifically. So there may be some cases where we still are looking at some type of risk.

Q. So what it boils down to, it is just a simple negotiation process. There are certain risks that the NUG will try and off load on you, and you will require certain benefits in return. And there is no policy or criteria for matching these things, it is just a matter of your overall judgment in negotiating the total package; is that fair?

A. I don't think that that's fair.

The reason for the balancing and the

trading off of risk is to make the project economic. To make those projects viable.

So typically if the project can get within avoided cost without any risk on either party, then that's exactly what we go for. If in some cases we would take the risk, for instance, of front end loading where we would pay a little bit more at the front end and pay a little less at the back end to make the project economic, we will do that, so that's again in some cases. We will consider the risks and the benefits to, in fact, make projects economic.

Q. But you have no criteria or no policy. What you are talking about is your overall judgment and your experience in negotiating contracts, and all of that is factored in to come up with an acceptable package.

A. No, we do have an operating guideline that we work towards to provide the bounds by which we would take on a risk where we would do any of the negotiations.

Q. Is that a public document?

A. No, it's not.

Q. I don't want you to tell me any specific terms of this policy if you feel that it is confidential, Mr. Vyrostko, but can you give us some

idea as to whether there is a particular set of trade-offs or criteria mentioned in the policy such that if you accept a certain amount of risk, that would have a certain translation over to the avoided cost, or some other type of criteria?

A. That guideline is not that specific with respect to trying to determine exactly what value of risk there is.

I think the value of risk has to be looked at as a judgment when you negotiate. But there are guidelines in there with respect to, for instance, how much front-end loading one would go for to ensure that there is enough opportunity at the back end of the contract to get the payments coming back. There are guidelines with respect to, for instance, how much guaranteed payments would you accept and how long would you allow those guaranteed payments to continue with respect to a contract. It talks about generally how much exposure that the corporation should expect when they are looking at a project. But most of those are not specific hard numbers because it varies from project to project. And the bottom line requirement is always that we work towards the project avoided costs.

Q. Panel, if you could turn to page 62 of Exhibit 340. I understand that is a press release

from Ontario Hydro dealing with independent power, dated July 11th, 1991. And if I could refer you to the fourth paragraph starting with the words, "The program." It reads:

The program is designed to encourage new non-utility generation, especially load displacement projects.

Then if I refer you to the paragraph below that. It says:

In the past, purchase projects have received financial assistance in special circumstances as approved by Hydro's Board of Directors, however, the new program makes a flexible package of six financial assistance options a regular part of the services offered by Hydro's non-utility generation division.

Do all of the six financial assistance options which are mentioned there apply to load displacement non-utility generators?

MR. BROWN: A. They are not as specific as purchase or load displacement, but a load displacement generator could take advantage of any one of those six.

Q. What about a municipal utility?

MR. VYROSTKO: A. Yes.

Q. So will load displacement generators receive financial assistance up to the point where they are being paid the full project appraisal avoided cost?

A. Yes, they can.

Q. Is that the same situation for municipal utilities?

A. If a municipal utility were to put a project forward then they would have the opportunity to take advantage of any of these programs.

Q. I understand one of the six financial assistance options is a low interest loan program; is that correct?

MR. BROWN: A. That's correct.

Q. And that low interest loan is given by Hydro to the proponent?

A. Yes.

Q. I believe the choice is up to the developer or the proponent whether they will avail themselves of this option.

A. They have to ask for it. We may not release it.

THE CHAIRMAN: I am sorry, I didn't follow that. What do you mean by release it?

MR. BROWN: We have criteria we look at

before we would offer a loan to somebody, such as a technical review or financial review.

In a lot of cases the developers aren't looking for loans so we don't go offering it to them. But if they ask for a loan then we have to do more homework, equivalent to what a bank would be doing to check out a loan.

THE CHAIRMAN: But these six programs are known programs, I take it, and so people know you have a low interest program.

MR. BROWN: Yes, they do.

MR. WATSON: Q. What does Hydro do to ensure that it will be repaid?

MR. BROWN: A. No. 1, we do our own technical review of the project. We insist on either a consultant study or equivalent of the project to prove its technical viability over the long term. We have our normal contractual requirements that ensure the long-term viability of the project, and we also do a financial review of the proponent.

Q. Okay, you mentioned a financial review, Mr. Brown. I would like to clear up one point before I move on. You have indicated that in certain of your negotiations you may or may not get all of the NUGs financial information?

A. That's correct.

Q. Would it be fair to say that in a situation where a NUG is asking for a loan that that would not apply, you would get all of their financial information?

A. We have to get that information or we wouldn't offer a loan to them.

Q. Now, when you do a financial review, I assume you are looking at security that a proponent can put up; is that fair?

A. That's one aspect, yes.

Q. What sort of security are you looking at?

A. It could be a letter of credit, it could be part of the project assets.

Q. A bond?

A. Anything that has some value to us. It depends on what the loan is being put towards as well. If it's going towards a project, it's mostly the assets we are looking for.

Q. Well, the reason I was asking that, Mr. Brown, is if a proponent can put forward good security such as a letter of credit or a bond, it seems as though the developer has a certain creditworthiness to post such security, if that's the situation why does

Hydro need to be involved in loaning money? Why can't he get the loan elsewhere?

A. He can.

Q. I beg your pardon?

A. He can.

Q. He can.

A. Yes.

When we initiated this program many years ago, financial institutions were not active in NUG development, and we started offering this program and there was interest.

Since financial institutions have become very active in their involvement in NUG projects, we have seen almost no requests for our own loans.

Q. Correct me, if I am wrong, Mr. Brown, my understanding was that Hydro had considerable amounts set aside for loans for NUGs; isn't that fair?

A. Not in terms of project size. I believe the number was about 90 million for low interest loans, and when you look at a project size, that's one project.

Q. Okay. How does that 90 million compare to the other financial programs? How much do you have set aside for some of the others?

A. The other ones don't require capital.

They are monthly payments or annual payments, and they are not capital, so they are treated differently, and the number I believe is $38 million for those over a five year period.

Q. So 90 million as opposed to 38 million, those are the numbers?

A. 90 for the loans and 38 for performance payments or interest rate buydowns.

Q. The other five options.

A. Yes.

Q. I assume it is possible that in a situation where Hydro gives a loan, some developers may have little, if any, equity in their project.

A. We are looking at, if we are offering the loan, to be in a position to get 75 per cent, at least 75 per cent of the project assets.

Q. Mr. Brown, I was interested in what you said about the current state of affairs. I guess in the past financial institutions were not rushing to loan money to NUG proponents and you are saying the situation has now changed.

A. That's correct.

Q. Based on that, is it fair to say that Hydro is going to reconsider their low interest loan program?

A. I think we are included it for flexibility. There may be some reason in the future where a particular proponent may want a low interest loan from Ontario Hydro. Current activities suggest that's not the case and that proponents are getting their own financing and are quite happy with just a rate if it's purchase or in load displacement in one of our other project options.

Q. Mr. Brown, my client is interested in the fact that Hydro is assuming risk. I guess we will all agree that one of the advantages of NUGs that you put forward is that there is an ability to off-load some risk.

Now, if there are other avenues open to promote these NUGs such as buying down the commercial financing rate, and they don't involve Hydro assuming any risk, and you have indicated that people are not coming forward and asking for it, why should there be this program?

A. I think we want to leave flexibility in our negotiation process. There may be a time when a proponent wishes to have that option available to them and it may be the only reason why that project goes ahead.

Q. So the flexibility is more important

than the fact that you are assuming risk?

A. It's a very small part of our business and it does involve risk by Ontario Hydro but we cover that risk with our due diligence before a project goes in service.

Q. Now, panel, let's take a situation where we have Hydro purchasing NUG power from a proponent for sale to another customer, as opposed to a situation where Hydro is purchasing NUG power for sale back to the same customer, now other than some small transmission differences, is it fair to say that those two situations are basically the same from Hydro's perspective?

MR. SNELSON: A. I don't think we can differentiate where the power to any particular customer comes from. Once the power has entered the system, then it can't be differentiated as to its source.

Q. Based on this, I would assume that it would be appropriate for load displacement generation to receive the same purchase prices, purchase non-utility generation; is that fair?

MR. VYROSTKO: A. That's correct.

Q. Now, if municipal utilities were allowed to build their own resources and receive

avoided cost rates for the power under, say, a simultaneous buy/sell program, the ratepayers would benefit from the differential between the purchase rate for the power sold to Hydro and the cost of the power being produced; is that fair?

[11:46 a.m.]

A. If the rates that were being paid for electricity were lower than the avoided cost being charged and paid for the generation, then there would be value there.

DR. CONNELL: Sorry, Mr. Watson. That question, the benefit applies presumably to the customers in the region of that municipal utility, does it?

MR. WATSON: I think the benefit could apply to those customers or it could be a more broad-based benefit.

DR. CONNELL: You meant the broader context, did you, when you framed the question?

MR. WATSON: I was thinking of the utility customers, but I think it could be a more broad-based benefit as well.

Q. And perhaps the panel could help us with that?

MR. VYROSTKO: A. Typically, if we were

to buy a non-utility generator there are advantages to the system to acquiring that generation, and typically, if we can get it below avoided cost where we would not only get that generation with the benefits it provides but also at a lower value than we would typically have, so there would then be that benefit to the group in total.

Q. Now, Mr. Vyrostko, if I could take you back to the question I was asking about the municipal utilities.

Now, instead of a municipal utility in there could I put in a NUG developer, the same question with a NUG developer? In that situation the differential is going to be reflected in profit to the NUG developer; isn't that fair?

A. That's correct.

Q. Now, as Ontario Hydro and I guess most of us are concerned about overall electricity rates to customers within Ontario would you agree that a NUG installed by a municipal utility is going to be more economically beneficial to the customers without the profit margin for the NUG?

A. To which customers are you referring?

Q. Can you think of some customers where it wouldn't be beneficial?

A. It would be beneficial to some customers, yes.

Q. Well, okay. I won't ask you to detail all those. The customers within the utility region affected?

A. There could be benefits to the local utility.

Q. Now, in your witness statement, page 6, which is reproduced at page 64 of Exhibit 340, at the top of the page, paragraph 19, you are indicating: The policies on backup power, simultaneous buy/sell, and competitive bidding are currently under development.

Can you give us any details on what's happening with simultaneous buy/sell?

A. I think at this stage what we are doing, we are developing a scoping document to try to identify all the issues that should be discussed as we move forward with the simultaneous buy/sell, and that's as far as we have gotten I believe to date.

Q. Do you have any idea when such a policy might be issued?

A. If in fact we were to go with the policy we would be looking at probably sometime next year.

Q. Are you consulting with the municipal utilities on that?

A. At this stage, because we haven't got the scoping document, we haven't been yet currently.

Q. Do you anticipate doing that before the policy is issued?

A. Again, it depends on the circumstances, what some of the issues that are identified in that policy are. Then if the impacted on the utilities we would be discussing that with them.

Q. Well, you are not telling us that a simultaneous buy/sell policy issued by Hydro would have no effect on a municipal utility?

A. No, I didn't say that. What I was trying to say is that I don't know what the implications of simultaneous buy/sell would be to us, and until I know what that is I am not sure who I will be discussing with that policy.

We may elect not to go at all, depending on what the findings are.

Q. Mr. Vyrostko, I am sure it comes as no surprise to you that the MEA is very interested in the issue of simultaneous buy/sell. Can you give my clients some assurance that before you implement a policy on that issue that you would consult with them?

A. I think in my direct evidence I talked about some of the groups that we're members of and committees that we sit on. One is the Non-Utility Generation Advisory Council, and the other one is -- we have been on a task group with the Municipal Electric Association on their parallel generation policy.

And to date we have used NUGAC especially to bring any proposed projects forward. The Non-Utility Generation Advisory Council, or NUGAC, has the MEA as a member, and clearly we would be then taking it to them.

Q. So before you implement that policy you would take it to NUGAC.

A. We would be discussing the implications of that policy to NUGAC.

Q. And the MEA would have an opportunity to make input at that stage?

A. They would.

Q. Mr. Vyrostko, can you help us as to what is the difference between simultaneous buy/sell and paying up to avoided cost for load displacement?

A. Typically, load displacement is where the developer or the customer would build a facility and use that facility themselves for their own electricity, and therefore, there may not be any net

sale coming to, for instance, Ontario Hydro, and therefore, there is no opportunity to give a purchase rate to that project.

So simultaneous buy/sell allows us to have both a selling transaction and a buying transaction so that that customer gets -- continues to buy electricity from the utility and then sells back to the utility for the generation.

With load displacement projects and with this financial assistance program that you were just previously discussing we now have that option and that opportunity to then ensure that that load displacement project, if it was not selling to Ontario Hydro, could still get the full avoided cost for the project through some of the programs in the financial assistance program.

So in essence, a load displacement project would get the same value as a project under simultaneous buy/sell.

Q. Following up on that, Mr. Vyrostko, if I could refer you to Interrogatory 5.14.51, and, Mr. Lucas, that's one of the interrogatories I gave you. It's not included in my package.

THE REGISTRAR: That was previously entered and is 321.31.

THE CHAIRMAN: Thank you.

MR. WATSON: Q. Mr. Vyrostko, if you could look at the second last sentence starting with the words "when the project avoided cost". That continues:

> When the project avoided cost is greater than Hydro's lost revenue, Hydro would see a net benefit and would share the benefit with the customer.

Can you explain in some detail what you mean by "sharing the benefit" and under what circumstances this would occur?

MR. VYROSTKO: A. Well, I think what we are saying there is to make that project economically viable we would in many cases have to pay the avoided cost. And so, therefore, we would then pay the avoided cost.

Q. And that's what you were referring to earlier, just a few minutes ago, when we were having the discussion on load displacement?

A. That's correct.

Q. Panel, turning to page 65 of Exhibit 340 we are still on Mr. Eliesen's speech, and if I could refer you to the last paragraph, the last sentence of that reads:

And we have plans to help municipal utilities play a larger role in the development of independent power.

Can you tell me what those plans are? As I am sure you can appreciate, my client is very interested in what Hydro perceives as the larger role for the municipal utilities.

Is there any document, or policy, or report?

A. Basically, there is a letter that we sent to the Government in response to the Government's request to have us accelerate our efforts on non-utility generation back in November of last year.

In that document, and I think we discussed it in our direct evidence, one of the initiatives there was to in fact assist with the municipal utilities in creating a greater awareness of non-utility generation within their developments, and so we have recently communicated to the Government what some of those initiatives would be.

Q. Can you communicate them to us?

A. Yes. For instance, some of them had to do with policy development; for instance, looking at backup policy as a fundamental issue with respect to municipal utilities and their movement towards

non-utility generation. It was assisting them with the analysis and the understanding of non-utility generation and how it applies to a lot of their customers, specifically load displacement projects; holding annual workshops or at least periodic workshops with the Municipal Electric Association to help their members understand what non-utility generation is all about.

So, it was a multi-faceted approach with both policy development and communication and assistance.

Q. Mr. Eliesen referred to plans. Are the plans written down anywhere, aside from this letter that you are referring to?

A. No, that is our -- one of the issues is for us now to develop that into a specific action plan with initiatives in there. This is a general overview as to what we felt we would like to do with the utilities in general and then we would develop specific actions coming out of that.

Q. And do you have people working on those plans right now?

A. Yes, I do. Well -- yes, I do.

Q. I suppose when Panel 5 finishes you will have more people working on those plans?

A. That was the comment I was going to make, yes.

Q. You mentioned the letter to the Government. Can you produce a copy of that letter?

A. I believe I can.

MR. WATSON: Can we have an undertaking for that, please, Mr. Chairman?

THE CHAIRMAN: Undertaking?

THE REGISTRAR: That will be 322.20.

---UNDERTAKING NO. 322.20: Ontario Hydro undertakes to produce letter to Government re action plan.

MR. WATSON: Q. Panel, if I could refer you to page 66 of Exhibit 340?

That refers to a question on Hydro's policy on non-utility generation and its application to municipal utilities, and your answer in the middle paragraph reads:

> Municipal utilities are given equal footing with private enterprise with respect to all NUG policies and programs.

And in your witness statement you referred to three financial programs or three assistance programs, if I could. One was the financial assistance program that we have just discussed a few minutes ago, and you have made that quite clear that

that applies to municipal utilities as well. That's correct?

MR. VYROSTKO: A. That's correct.

Q. Another assistance package that was mentioned was the consultant study assistance program. Does that apply to municipal utilities?

MR. BROWN: A. The intent of the consultant study assistance is for customers of Ontario Hydro, and municipalities are customers of Ontario Hydro. It is a focus on cogeneration projects.

Q. So the answer is "yes"?

A. If a municipality wanted to build a cogeneration facility and they needed some assistance in studying it, then we could help them.

Q. They would be equally as eligible as a private developer?

A. They have to meet the same criteria, that's right.

Q. Now, your interrogatory uses the words "equal footing".

When looking at the difference between a private developer and a municipal utility, I think one of the significant issues to look at is finances.

Now, isn't it fair to say that a municipal utility, in effect, has to make financial

disclosure to Ontario Hydro? Doesn't Hydro have in effect access to a municipal utility's books?

MR. VYROSTKO: A. Yes, we do.

Q. Whereas, you have indicated in your testimony that not all NUG proponents are going to provide you with complete financial information; isn't that fair?

A. That's correct.

Q. Now, if I could look at another area, the transmission adder. Now, if a NUG is within a municipal utility franchise area it is eligible for a transmission adder; is that correct?

A. I believe so.

Q. In the same situation would the municipal utility be eligible for the same transmission adder?

A. Depending on the circumstances, I would think that if there were applications appropriate they would.

Q. Panel, I have provided you with another exhibit.

THE CHAIRMAN: Perhaps you should give 5.9.14 a number?

THE REGISTRAR: That will become the vacated number 321.49.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.49: Interrogatory No. 5.9.14.

MR. WATSON: Q. Panel, I provided you with an exhibit which is the first page of a Ministry of Energy report. It is entitled "Cogeneration Encouragement Program". I believe I have provided copies to Mr. Lucas.

THE REGISTRAR: That would be Exhibit No. 341, Mr. Chairman.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 341: Ministry of Energy report, entitled "Cogeneration Encouragement Program".

MR. WATSON: Q. Panel, you will see that this Exhibit No. 341, which is entitled "Cogeneration Encouragement Program", refers to three assistance packages.

Now, is it fair to say that these assistance packages are in addition to the Ontario Hydro assistance programs that we have been discussing?

[12:08 p.m.]

MR. BROWN: A. No, that is not true.

Q. So if you get the government assistance package, you cannot get Hydro assistance?

A. No we have been co-ordinating our efforts with the government. It is usually one or the

other.

Q. So there are no NUG projects that have both government assistance through one of these programs and Ontario Hydro assistance?

A. The government may have co-operated in a study with us in our program, but it wouldn't have fallen under this program specifically.

Q. Would they have contributed some money when they co-operated with the study?

A. That's correct.

Q. Well, I'm not sure I see the difference, Mr. Brown.

A. Well, I guess...

Q. If we have a separate government program that someone can go to and get money there, what's the difference between that and the government providing you the money to do the same study?

A. Well, I guess my point is that they are not additive. You can't go to the government and get all their money and then come to Ontario Hydro and get all their money and put it in your pocket and you can do a study. When this happens, we talk to the government and the proponent, we co-ordinate our efforts so it is one proposal, not 2 different proposals.

Q. I notice in looking at this that the provincial programs have caps. Do the Hydro programs have caps?

A. That's correct.

Q. Are they similar?

A. No. Our cap is 50 percent or 50 thousand. The understanding is that the government program is addressing smaller cogeneration opportunities. Ontario Hydro is looking at the larger cogeneration opportunities.

Q. Panel. If you could turn to page 67 of Exhibit 340. That's Interrogatory 5.9.40.

THE CHAIRMAN: Could we have the number for it?

THE REGISTRAR: Oh, I beg your pardon. 5.9.40 is 321.52.

---EXHIBIT NO. 321.52: Interrogatory No. 5.9.40.

MR. WATSON: Q. That Interrogatory discusses replacement and supplementary power, and it assumes at the bottom of the answer, the third paragraph, that 25 percent of NUG capacity is low displacement power. Is that number still valid today?

A. I haven't looked at that for the 1991 NUG plan yet.

Q. Well, the only difference could be

what would be occurring with the extra 1,000 megawatts, is that correct?

A. A simple analysis is that the 1,000 megawatts is all purchase and would decrease this number.

Q. So if it decreased the number, in effect, the megawatts would still be the same if the percentage differed roughly?

A. I expect the megawatts to be fairly similar.

Q. And you indicate that it is not known how much of the load displacement power would use replacement power or supplementary power. Is that still accurate?

A. That's a choice made by the proponent. Both are available.

Q. I understand that, but your answer was that you don't know at this time what's going to happen. I guess where I'm leading with that is that I'm curious as to whether any amount for the replacement power has been included in your reserve margin calculations or your demand/supply balance calculation.

MR. SNELSON: A. Perhaps I can speak to that? We make allowances for reserve requirements on

non-utility generation. We don't do it explicitly by counting up whose contract is for replacement power and who is contracted for supplementary power.

Q. Is there a document somewhere that tells us how you account for NUGS in your reserve margin? I don't want to get into an in-depth discussion now. I know we spent a lot of time with Panel 2.

A. I think it was discussed in Panel 2 but we do it by means of assuming a certain degree of forced outage rate for non-utility generation.

Q. Back in your Supplementary Witness Statement on page 64 of Exhibit 340 -- you don't have to turn to it -- the same sentence, "Policies on backup power simultaneous buy/sell and competitive bidding are currently under development. The same question with respect to backup power. Where are you with respect to your policy?

MR. VYROSTKO: A. I think we're about the same place as with simultaneous buy/sell. We are developing a scoping document to identify all of the issues that have to be addressed, and then from there we're going to develop an action plan as to how do we get at all of those issues.

Q. Is the same time frame reasonable?

Next year maybe?

A. I'd say maybe.

Q. So you're not as firm with this policy as you are with the simultaneous buy/sell that we were discussing?

A. I don't know really what to extent the policy and the policy development will take us. And, again, if it requires a number of detailed studies, those studies may, in fact, take a long time to, in fact, to get some conclusions from, and so until I know all of those elements I really can't say how long it would take.

Q. Hydro has assumed a 90 percent dependability factor for cogeneration, is that correct?

MR. BROWN: A. That's correct.

Q. If I could refer you to Interrogatory 5.14.141, which is at page 68 and 69 of Exhibit 340. If I could have a number for that, please?

A. I believe this one has already been numbered.

THE REGISTRAR: That is number 15. Yes.

MR. WATSON: Thank you.

Q. Now isn't it fair to say that the actual dependability of existing cogeneration units is well lower, well below Hydro's assumption of 90

percent?

MR. BROWN: A. The cogeneration facilities that are selling electricity to Hydro, which are all new, are not demonstrating 90 percent yet.

Q. Well, historically you have not had facilities at 90 percent, have you?

A. Well, we have 85, 87, 79, so it's been close but, again, these are very few facilities and January '89 is when we started this.

Q. We touched on this briefly a few minutes ago and I would like to come back to it.

We were talking about the potential that economic times could cause the shut down of a plant.

Now if, in fact, a cogeneration unit that we've been looking at here went out of business, Mr. Vyrostko, you indicated that Hydro has contract provisions which would allow them to take over the site if you needed the power for the project, is that fair?

MR. VYROSTKO: A. Typically that wouldn't be for the cogeneration plant. It would be more for purchase projects.

Q. So what would happen in a cogeneration plant? You don't have the contractual ability to do that?

A. Typically. If it was a cogen plant

associated with, again, steam, which it clearly is, if it were to go down, both the load would go down and a generation would go down, so to some extent you end up losing both sides of the equation.

Q. And you also lose the at will part of the equation too, don't you?

A. If there was at will then, yes, you would lose the at will, that's correct.

Q. Well, you certainly have referred to at will throughout your Demand/Supply Plan and your NUG plan?

MR. BROWN: A. It is a very small component of energy.

Q. So I assume what you're saying is that Hydro wouldn't go in and operate the facility? It would just assume that the load was lost and the steam was lost as well?

MR. VYROSTKO: A. I think on the cogeneration facility where there has been an industrial plant there, it would be very difficult for us to, on our own, walk in and operate that plant.

[12:20 p.m.]

Q. If you to turn to page 71 of Exhibit 340, please, panel. This is again an excerpt from the independent consultant who reviewed the 1989 NUG plan,

and that's included in 5.9.54, which already has a number.

THE REGISTRAR: 321.7.

MR. WATSON: Q. I have two pages there, in particular if you could refer to the second page, which is page 72, at the top of the page, the consultant is talking about a term called the post power purchase contract failure rate, and the consultant indicates that most utilities have used ratios between 40 and 70 per cent, while using 100 per cent when the projects were under construction.

Now, in Hydro's plan it is assuming a zero per cent post power purchase contract failure rate, isn't that true.

MR. BROWN: A. That's correct.

Q. And in addition to the post power purchase contract failure rate, I assume it's also fair to look at the pre-purchase power contract failure rate, and I would suggest that would be a factor as well. In fact Hydro --

THE CHAIRMAN: I don't follow that. What do you mean?

MR. WATSON: In effect projects that are put forward that don't come through.

THE CHAIRMAN: They can't have a failure

rate until they go into operation, can they.

MR. WATSON: Perhaps I will change the terminology.

Q. You have a situation where not only can you have projects that don't go forward after the contract is signed, you can have a situation where projects that are put to you prior to commitment will be withdrawn for any number of reasons.

MR. BROWN: A. That's correct.

Q. And so looking at the pre-contract stage, we would find the 1,000 megawatts of extra NUG in that stage; correct?

A. I am not sure of the number. There is about 3,000 megawatts of proposals on the table and we have always said that you are not going to get all of it.

In the NUG plan we try and to do an assessment of some of those projects that have a high degree of probability of going forward and to put that in the forecast.

Q. I understand that, Mr. Brown. What I was referring to specifically was the 1,000 megawatts of extra NUG that we have been talking about. That's all in the pre-contract stage, isn't it?

A. That's correct.

Q. And therefore, Hydro is assuming that there is not going to be any pre-contract or post contract problems with this 1,000 megawatts; isn't that fair?

A. In our preliminary forecast we assumed all of those would succeed, yes.

Q. Panel, you have discussed the advantages of NUGs and one of them is the diversity of supply; is that correct?

MR. VYROSTKO: A. That's correct.

Q. And I suppose part of the idea there is that many small plants would lead to higher reliability; is that fair?

A. In general terms, if they were all reliable plants, then that's correct, they would provide higher reliability.

Q. Although that really doesn't apply to things like major supply NUGs, especially as the Chairman said if you have no upper limit on them, does it?

A. The major supply NUGs would not be as dispersed as the smaller NUGs would be, so part of that advantage would not necessarily be there.

Q. Now, I think we have established that the majority of NUGs are fueled by gas; is that

correct?

A. That's correct.

Q. And of course when I was looking at this I harkened back to a discussion I think that Mr. Snelson and I had in Panel 2 when you were talking about common mode failures, if you will, and if a great majority of NUGs are fueled by natural gas, aren't we into a situation where these NUGs are susceptible to something analogous to a common mode failure? Something that's applicable to gas a whole could affect all of these supply options; isn't that fair?

MR. SNELSON: A. Depending on the circumstance then that's potentially possible, yes.

Q. I guess it goes without saying if that occurred, it would destroy or severely affect the economic benefit of NUGs to the system.

A. I think all options have some potential for common mode failures and that's a risk that must be accepted with all options. One tries to keep the risks to a minimum.

Q. During Mr. Rodger's cross-examination there was some discussion with him regarding the use of condensers by cogenerators, and the point was that condensers could be used so that cogenerators could operate when the steam is not required by the

industrial process. Do you recall that, panel?

MR. BROWN: A. That's correct.

Q. Now, isn't it fair to say that not all cogenerators have such condensers?

A. The high efficiency ones don't normally have condensers.

Q. And the ones that do have condensers may not have condensers that are rated highly enough to deal with the high pressures and volumes of steam that would be forth coming in such a situation; is that fair?

A. I am not sure of that. It depends on the actual design. There may be the odd one that is not fully designed to take all process steam through the condenser if the process is off. There are some designed to take the full output of the generators without process as well.

Q. And the ones that do not have the appropriate design criteria, they are not going to be able to operate at full capacity; isn't that fair?

A. There would be some derating if the process is decreased.

Q. Do you have any idea what percentage of the sites have condensers and of those that do have condensers, how many are appropriately sized

condensers?

A. The ones that are in service, there is no condensers. The new project proposals we have, I don't know if they are that far along in the design that they would know exactly what size the condenser is going to be, so I can't provide a number at this time.

Q. Well, is it an Ontario Hydro policy that, shall we say, the new cogeneration facilities have these condensers so that they would be available?

A. No, it's not.

Q. If we are talking about the normal cogeneration facility, not the over-sized cogeneration, is it fair to say that if the project is not using the steam for its industrial process, it is generally not economic to produce power based on the time differentiated rates?

A. In the majority of cases that's true. There are probably other cases where the use of waste fuels would be economic.

Q. As we have discussed this morning, that would be in a very small percentage of the applications.

A. In terms of 3,100 it's small, yes.

Q. I had a question on how NUGs are dealt with in the F&D model that we discussed in Panel

2, the frequency and duration model. Mr. Snelson, I guess this question would be directed to you.

How are NUG DAFORs treated in the F&D model? Do they assume a 5 per cent or a 15 per cent forced outage rate?

MR. SNELSON: A. I think we have given an undertaking on that in Panel 2. Actually, the undertaking I was referring to was for your own, one of your own undertakings, 142.27. I notice that that refers to the planned outage factors and the maintenance outage factors.

Q. What about the forced outage rates?

A. I have a page of transcript here, which is page 3221, I am afraid I don't have the volume that it comes from, and it was Mr. Taborek's testimony that the forced outage rates assigned to NUG units are 10 per cent. Now, that is at the time at which the F&D studies were being done that determined the 24 per cent reserve margin.

In current modelling we would be using the DAFORs from the latest corporate forecast of outage indices which is also an exhibit in this proceeding, and they, I believe, identify a 15 per cent forced outage partly due to steam derating and partly due to equipment problems and that's what would be modelled.

Q. So, it's a 15 per cent number that's used in the F&D model now?

A. That would be used in current studies. 10 per cent was used at the time of setting the 24 per cent reserve margin.

MR. WATSON: Mr. Chairman, you indicated yesterday that you wanted to finish at four o'clock. If that's still your intention, perhaps now would be a good time to take lunch.

THE CHAIRMAN: All right.

MR. WATSON: I can tell you that I am moving quite quickly. I would say I might be another hour.

THE CHAIRMAN: So if we stop now and came back at two o'clock, that would be all right?

MR. WATSON: I think that would be fine.

THE CHAIRMAN: All right, we will do that.

THE REGISTRAR: The hearing is adjourned until two o'clock.

---Luncheon recess at 12:32 p.m.

---On resuming at 2:03 p.m.

THE REGISTRAR: This hearing is again in session. Be seated, please.

MR. B. CAMPBELL: Just before continuing,

Mr. Chairman, I believe there was a matter that Mr. Brown had undertaken to speak to just after the lunch break and he is prepared to deal with that.

THE CHAIRMAN: Okay.

MR. BROWN: This morning we were discussing the pulp and paper contribution in the achievable potential. If I could turn you to Interrogatory 5.9.48, there is a breakdown by megawatts. I think the request this morning was a breakdown by the number of projects, and the answer to the question is, 9 out of 19 projects are in the pulp and paper industry.

MR. B. CAMPBELL: 321.37.

THE CHAIRMAN: Was that not previously recorded?

MR. B. CAMPBELL: Yes. 37.

THE CHAIRMAN: 37, all right. Thank you.

MR. WATSON: Thank you, Mr. Brown.

Q. Now, this morning, panel, we were discussing the fact that NUGs are expected to receive a transmission credit in the forecasts that you have been preparing. Is it fair to say that there have been examples of NUGs in the past that have posed transmission problems on the existing system?

MR. VYROSTKO: A. I think there have

been situations where projects have created some problems on the transmission system.

Q. Shouldn't the probability of this problem or this possible problem be reflected in the derating of the transmission credit?

A. Typically, if there is a cost associated with connecting the non-utility generator in terms of overall system implications, that would be charged to the developer.

Q. Are those costs charged if the problem occurs after-the-fact as well as if they occur -- or if they are anticipated before the fact?

A. I think it would be very difficult to try to identify an after-the-fact situation and go back to contract and try to do something about it.

The whole point of our work to try to integrate NUGs is to identify at the front end all of the implications and then incorporate that into the contract.

Q. I understand that, Mr. Vyrostko. My concern was that I have been advised that there have been -- there is at least one situation where a NUG caused a transmission problem after it was hooked up to the line, and that would be after the contract process was over. My information is the EB Eddy plant near

Ottawa.

MR. BROWN: A. I don't believe EB Eddy has posed a problem in our system at the Ottawa plant. They are looking at a proposal on that site. It's one of the historical NUGs that's been around for a long time. They are not selling anything to Ontario Hydro.

Q. So your evidence is to the best of your knowledge, there has not been a problem with historical NUGs on the transmission system?

A. There may be an occasion such as a forced outage on our transmission system that may require some action on behalf of a NUG over an hour or two on a short-term basis for emergency conditions, and to date, NUGs have responded to that need.

Q. Panel, if you could look at pages 73, 74 and 75 of Exhibit 340, and that is Interrogatory 5.14.111.

THE REGISTRAR: That was previously entered under 321.3.

MR. WATSON: Q. And you will notice on page 75 there is a map that we have seen before showing the areas of relative preference. I think we discussed this morning that this sort of analysis was not taken into account in the NUG forecast; is that fair?

MR. BROWN: A. In the 1990 NUG plan we

only looked at the east/west flow going to the northwest region and these are outside of that area.

Q. And for the '91 forecast?

A. The '91 plan we are going to develop the plan with no transmission restrictions, to identify where we think NUGs will go without the transmission restrictions.

Q. So that means that NUGs which occur in the undesirable areas would also be given a transmission credit in the same way that those in the desirable areas would get the credit?

A. In terms of the forecast they are all being treated equally but not in negotiation.

[2:08]

Q. Now in looking at the calculation of the transmission credit, perhaps Mr. Snelson this question is for you.

Is that, is that calculation shown in Exhibit 84, the avoided cost determination back in 1989. If not, could you tell me where it is?

MR. SNELSON: A. I believe it's going to be dealt with in Panel 7, and in detail, and that the interrogatory which attaches the material is actually Interrogatory 7.7.16, and Dr. Macedo will be able to talk to it in greater detail than I can.

THE REGISTRAR: That will be 321.53.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.53: Interrogatory No. 7.7.16.

MR. WATSON: Q. Is it fair to say that the transmission credit is in, effect, a levelized type of calculation?

MR. SNELSON: A. Yes.

Q. And when we're dealing with that sort of calculation, aren't we talking about, in effect, a linear one for one relation, if you will, between a NUG load given the credit and the transmission need displaced?

A. It's an average levelized value, so it's an average across the province, and it is levelized in terms of time.

Q. Is that not a linear relationship?

A. It's assumed to be linear.

Q. And we know that all of the NUGS in the forecast are assumed to be dispatchable. Wouldn't you expect that as the level of non-dispatchable NUGS increases in an area that there is not going to be a linear one for one reduction in transmission need?

A. I haven't thought of it in those terms. The way I tend to think of it is that non-dispatchable NUGS in an area are, do not cause

transmission problems provided the minimum load in the area is higher than the amount of non-dispatchable generation in that area or significantly higher and/or that the transmission capability out of the area is large compared to the amount of non-dispatchable generation in the area. It is the two things. It is the amount of the load there is to absorb the generation even in the minimum load times and the capability to get the excess generation out of the area. So if the amounts are relatively small in that sense, then the non-dispatchability should not increase transmission requirements.

Q. And, of course, the converse is true. You're saying if they're small there isn't a problem? If they aren't small, there is a problem?

A. It is possible at that they may cause transmission concerns, and that's one of the things that we have identified as being something we have to pay more attention to, particularly for non-utility generators that have the freedom to site in places that are suitable from the power system point of view.

Q. When you say you're going to pay more attention to it, does that mean that you're going to consider whether there should be a derating of the transmission credit in certain instances?

A. The area we expected to have a significant influence in is when it comes to a need for and a selection of major supply NUGS because they are non-utility generators who are primarily producing electricity and should site according to the needs of the transmission system and electricity system. The cogeneration and waste fuel generation and hydraulic generation, then there may be some adjustment to avoided cost methodology to account for it, but we haven't determined what that is yet.

Q. The other area you did mention was oversized cogen. Can we a assume that that would be treated for your analysis in the same way as major supply NUG?

A. I think Mr. Vyrostko may be having something to say about that to the cogen people tomorrow and will be advising this Board of what was said there when we resume.

MR. CHAIRMAN: I guess I should interject. For my own information, Mr. Campbell, what exactly is your understanding of what is happening tomorrow? It has been referred to obliquely several times.

MR. B. CAMPBELL: It's simply that the project proponents, as I understand it - perhaps Mr.

Vyrostko could correct me if I am wrong - the project proponents who have projects under consideration at this time, a meeting of those project proponents is being convened in order to advise them of the criteria that the Corporation has determined as to where this efficiency cut-off would be put in place, and criteria, as I understand it, that are related to that matter.

The panel will recall that we've talked at what point does a, for instance, a cogeneration NUG that has certain characteristics become, in effect, a major supply NUG and thereby lose the preference and so on, matters of that type or become subject to different considerations if, in fact, they're going to be considered at all. It's those criteria that are being communicated to the industry, at least those members of the industry who have projects under active consideration, and that meeting is being held tomorrow, as I understand it, Mr. Vyrostko.

Have I approximately described it correctly?

MR. VYROSTKO: Yes, you have.

MR. CHAIRMAN: And then will there be a product out of that meeting that will be filed here or...

MR. B. CAMPBELL: Yes, we anticipate

that and I hope to provide it to my friend after the meeting tomorrow, and we hope to file it here next week.

I gather that these guidelines are now in a form that -- some small number of pages, and will be distributed here next week.

Our concern is as, as I say, has simply been that we felt that the corporation felt that it would be most appropriate to communicate this information directly to the project proponents and avoid, if it was possible to do so conveniently, the possibility of them learning bits and pieces of it by reports from this process.

MR. CHAIRMAN: Okay. Thank you. Sorry, Mr. Watson.

MR. WATSON: Thank you, Mr. Chairman.

Q. Mr. Snelson, one more system question.

I believe you have indicated that if a lot of NUG power was offered to you, that system integration would be a major, major factor. I assume it goes without saying that as the number of NUGS increases, the system integration becomes more difficulty?

MR. SNELSON: A. I wasn't going to use

the word "difficult", but it becomes more significant and more necessary that the integration factors be taken into account.

[2:18 p.m.]

Q. Panel, previously - and I believe it was during Mr. Shepherd's cross-examination - you were asked some questions - and I believe it was you, Mr. Brown, who responded - about the solar/thermal project in California. I believe it's calls the Luz project?

MR. BROWN: A. I did get questions on that, that's right.

Q. Now, are you aware that the Luz project has had recent employee layoffs and severe financial difficulties?

A. I know they are under financial problems, that's correct.

Q. And I have reproduced on pages 76, 77 and 78 of Exhibit 340 an excerpt from a weekly publication which is circulated in the northwestern United States dealing with electricity utilities and is called the "California Energy Markets".

Are you familiar with this publication, Mr. Brown, or any of the other members of --

A. We have several publications in our office. I don't remember seeing this one, no.

Q. Okay. What this publication does in this particular issue is refer to the Luz project a number of times, in particular dealing with financial difficulties that it appears to be having. Is there anything more you can tell us about the difficulties of that project?

A. I think, first of all, this is not a technology that we see coming to Ontario because it is a solar/thermal where you need direct sunlight and usually located in deserts. So we haven't paid a lot of attention to it.

In an undertaking I did for Mr. Shepherd which I hope to file soon, 322.3, I mentioned to him that I was aware of a few NUG projects that had been retired, and I was going to undertake to identify those, and in that undertaking this project did come up, and the California Energy Commission told us that they would not put this project on that list at this time.

THE CHAIRMAN: In other words, it would still be possibly a viable project; is that what you mean by that?

MR. BROWN: Yes. It is definitely having difficulties and there are some new players coming in to try and save this project.

MR. WATSON: Q. Panel, if we could turn to the issue of emissions for NUGs?

Mr. Snelson, in choosing a supply plan we have heard in previous panels that there is a limit placed on acid gas emissions for the province which Hydro must adhere to, and I assume you have no difficulty with a statement that this limitation can affect the resource mix?

MR. SNELSON: A. Yes, it is a limitation specifically on the emissions from Ontario Hydro plants.

Q. Yes.

A. Imposed by the Provincial Government.

Q. And the emissions from NUGs which produce electricity and are fossil fueled are not accounted for in this particular limitation total, are they?

A. That's correct.

Q. But, of course, we know that fossil fuel NUGs will contribute to acid gas emissions. In particular, they will contribute to NOX and CO(2) emissions; is that fair?

A. They will, if they are fired on natural gas have very low if any sulphur dioxide emissions. They may have some nitrogen oxide

emissions -- or they will have some nitrogen oxide emissions, and those two together are what is regulated as acid gas emissions. Carbon dioxide emissions are something separate.

Q. That's correct. Carbon dioxide is not an acid gas, but they do contribute to carbon dioxide as well?

A. That's correct.

Q. And if you turn to page 79 of Exhibit 340 I have reproduced page 4-2 of Exhibit 4, which is the environmental analysis, and if I could refer you to the right column, line 28, the sentence starts:

> Although these emissions are only a small fraction of the total emissions associated with each plant, emissions on a per terawatthour basis may be quite similar to large, conventional generating stations.

Is that statement still valid?

MR. BROWN: A. First of all, I think the emissions that this statement was based on was based on the 1989 NUG plan which was 1,600 megawatts, and we are now looking at 3,100 megawatts, so there will be more emissions in the forecast than as stated here.

MR. SNELSON: A. I think the point

though is that the emissions are similar to those from a large conventional generating plant using the same sort of technology.

Q. Yes.

A. So, if you were to have a combined-cycle plant owned by a non-utility generator or one owned by Ontario Hydro then the emissions per terawatthour or per gigawatthour, whatever energy measure you use, would be very similar.

THE CHAIRMAN: But this difference is that it wouldn't be subject to the same limitations that you have?

MR. SNELSON: The regulations as currently framed are on individual entities.

The smelting industry has certain emissions they have to abide by on a company-by-company basis, and we have an emission limit that we have to abide by. And the NUGs are not part of that.

THE CHAIRMAN: But some NUGs might be part of it if they fell into the industrial category, would they?

MR. SNELSON: The category, I believe, is company by company, so...

For instance, Inco is a major smelter and has an acid gas emission limit. If they were to be

generating electricity I presume that as a cogenerator then their emissions might be counted within their emission limit.

MR. WATSON: Q. Just following up on the Chairman's questions, Mr. Snelson, when we are talking about the acid gas limitations you are talking about four companies, if you will, Ontario Hydro being one of those companies?

MR. SNELSON: A. I am not sure that I can confirm whether it is four or not.

Q. Well, it is on a company basis?

A. As I understand it.

Q. Yes. Most of the cogeneration units that are out there are not going to be in the category of one of these four, or whatever number of companies we have?

A. Probably not. They are subject to separate regulation by provincial government as they see appropriate.

THE CHAIRMAN: I'm sorry, I didn't hear the end of that.

MR. SNELSON: I say, they are subject to environmental regulation by the provincial government as to whatever regulations they deem appropriate.

THE CHAIRMAN: Yes, and those

regulations, as I understand your evidence, aren't in place except for a few named companies. Is that right?

MR. SNELSON: We are getting into an area that is a little difficult, but there are specific regulations that put limits on the amount of acid gas emissions that Ontario Hydro and certain other major industrial concerns can emit.

There are also more general air quality regulations, such as, under Regulations 308 is a number that springs to mind, which I believe everybody has to meet.

THE CHAIRMAN: I see.

MR. WATSON: Q. And, of course, the four or whatever number of industries you are talking about have to meet the regulations - you said Regulation 308 - but the acid gas is on top of that?

MR. SNELSON: A. Yes.

Q. And the acid gas limitation is a limitation of 215 gigagrams of acid gas emissions per year for Ontario Hydro?

A. After 19--

Q. After 1994.

A. --94, yes.

Q. And of that 215 gigagrams SOX, sulphur dioxide or the SOxs, cannot be more than 175

gigagrams; is that correct?

A. I believe so. I would have to check the number to be sure.

Q. So if we are at the top of our SOX limit basically we have only 40 gigagrams remaining for NOX; is that fair?

A. That's the apparent implication.

Q. If it was decided to include the NUG NOX totals in the total provincial electricity producing totals, that would have an impact on Hydro's ability to use fossil fuels; isn't that correct?

A. That is possible. There could be some practical difficulties in doing that in terms of facilities that produce electricity and steam and allocation of emissions to one or the other product.

Q. There certainly wouldn't be any difficulty with the major supply NUGs or with the oversized part of cogeneration?

A. The cogeneration is a matter of degree, but with the major supply NUGs you are correct.

Q. I assume what we are talking about is air quality, so I suppose it doesn't matter from a point of view of the person in the street whether the NOx comes from Hydro or whether it comes from a NUG; it's still a concern. Isn't that fair?

A. I am not sure that I am able to comment on the way in which the regulations are set.

Q. If it was decided that the NUG emissions should be combined with the Hydro emissions to get a provincial total and it turned out that that would result in Hydro exceeding its NOx limitation, Hydro would be put in a situation where it would have to change its supply mix; isn't that fair?

A. We are talking about a hypothetical situation. It is not clear to me whether in fact if non-utility generation was to -- some umbrella regulation was to be put into effect whether in fact there would be an increase in the amounts that were committed.

We don't specifically have a regulation on NOx at the moment.

Q. We have the 215, which is a combination--

A. Yes.

Q. --of SOx and NOx, and by implication if you are at your SOx total you are only going to have 40 gigagrams of NOx available?

A. Yes, if you -- strictly speaking, if you have a regulation on the sum of SOx and NOx and the regulation on SOx alone, then you don't have a specific

regulation on NOx because you can cut back on SOx emissions, sulphur dioxide emissions, to permit more nitrogen oxide emissions.

Q. That was my point. If you are cutting back on your SOx limitations you may be affecting your supply mix?

A. You may be affecting what you can do on your supply side in terms of what level of sulphur you can use in coal or how much acid gas emission controls you need on your plants.

Q. Or whether certain plants can even run?

THE CHAIRMAN: Have you calculated whether, if Hydro's limitations would include Hydro-purchased NUGs, whether or not you would meet the limitations or exceed them?

MR. SNELSON: I cannot recall specifically having done that calculation.

Until recently we have been quite uncertain as to what sort of emissions NUGs would have in terms of their nitrogen oxide emissions.

THE CHAIRMAN: But based on your forecasts and the forecast mix, as you did with your own supply you made some forecast as to whether or not you would stay within the limitations or not, and I

just wondered if you had also made the calculation, if you included the purchase NUGs in that, whether you would meet the limitations or whether you would still stay under.

MR. SNELSON: As I say, I do not recall having seen that calculation. It may have been done, but I don't recall having seen it.

MR. WATSON: Mr. Chairman, I was going to deal with that point as well, and perhaps I could just skip ahead a little bit and deal with it now.

Q. Panel, if you could turn to page 82 of Exhibit 340, that also is an excerpt from Exhibit 4, the environmental analysis. It is Figure 4-1 which shows the annual atmospheric emissions from NUG in the period from 1989 to 2014. And that is based on the 1989 NUG plan, I assume; is that correct?

MR. BROWN: A. The numbers available at that time were the 1989 numbers.

Q. Yes. And, unfortunately, this copy is a black and white copy and your graph is a colour graph, and just for the benefit of those reading the transcript and those who don't have their Exhibit 4 before them the top line is the NOx line, is that correct, and the CO(2) line is the middle line, which is very faint, and it ends just below the 3 mark on the

year 2014, and the lower line is the SO_2 line.

Does that accord with your understanding, Mr. Brown or Mr. Snelson?

MR. SNELSON: A. Yes, it does.

Q. So, we see that the vast majority of the emissions are anticipated to be from NOx?

A. No, that's not correct. The left-hand scale is a double scale, and the scale for SO_2 and nitrogen oxides is in gigagrams and the scale for carbon dioxides is in teragrams.

So, in fact, if you put it all on a scale of gigagrams then the carbon dioxide number would be a thousand times larger than indicated here, so the bulk of the emissions are carbon dioxide.

Q. I just want to make sure I heard that figure right. You said it would be a thousand times larger?

A. Yes.

Q. Now, you said this was for the 1989 forecast. Could you tell us what would the graph look like if the 1991 forecast of 3,100 megawatts was used?

MR. BROWN: A. The numbers now are approximately -- in megawatts are about 2-1/2 times higher.

Q. Is there a linear relationship? Can

we say these figures would be about 2-1/2 times higher?

A. Where the uncertainty lies is in the estimation of the NOx numbers, and at the time this was produced we used in footnote No. 2, 17 per cent, and what we are looking at now is whether that is an appropriate assumption or not. And we are looking around now for information to give us a better handle on the NOx emissions from NUG facilities, and there is not a lot of information on this.

Q. Well, could you give us an updated version of Figure 4-1 for the 1991 plan, including updates to Notes 1 and 2, giving us your best estimates as of today?

A. In the 1991 NUG plan there is going to be an environmental assessment section for the first time, and we are trying to establish this criteria for the 1991 NUG plan.

Q. I appreciate that. Are you going to give us this graph in the 1991 NUG plan, and if not, could I get you to give me this graph and the changes to the notes?

A. I think I could help you with the notes part. What may be difficult is trying to establish the numbers themselves.

As Mr. Snelson earlier identified, it is

difficult in a cogeneration facility to attribute how much of the NOx is related to the electricity production and how much is related to the steam production, which is why we were trying to find some information in this area, and we are having very little difficulty.

I don't know if I am going to be able to come up with a NOx number.

Q. You said "very little difficulty". I assume you meant you were having a lot --

A. Oh, sorry. Yes, we are having very little "success" in finding the number.

MR. SNELSON: A. I can help you a little in that our current view is that the per unit NOx emissions are quite a lot less than what were considered to be appropriate at the time this figure was put together, and this figure was put together in '89, and we hadn't seen what sort of nitrogen oxide controls would be put on NUG units.

I believe this assumes that there would not be steam injection in the combustion turbines, and that steam injection is, in fact, being used in quite a lot of NUG projects, and they have somewhat considerably lower per unit emissions.

So, I wouldn't like you to suggest that

it's going to be even in the same order as multiplying this figure up by the ratio of megawatts.

[2:40 p.m.]

THE CHAIRMAN: Just so I am clear, I take it that there is no figure or diagram or statement equivalent to Figure 4-1 that was made for the 1989 plan for the 1990 plan; is that correct?

MR. BROWN: That's correct.

MR. WATSON: Q. Panel, I guess my request remains the same. I understand what you are saying, Mr. Brown, that you are having some difficulty with the figures. In 1989 you made an estimate, I assume that you are in the process of making estimates. I would appreciate it if you could provide us with the update to Figure 4-1, the update to the notes with your best available information.

THE CHAIRMAN: And if that or something equivalent to it is going to be in the 1991 plan, would you be prepared to await that?

MR. WATSON: That is fine, Mr. Chairman. Just when Mr. Brown answered that question, I just wanted to be sure of what we were getting.

MR. B. CAMPBELL: That will be fine. I don't know whether we have actually got an undertaking on the record to provide the 1991 NUG plan when it's

published. I just think as a matter of course we will be providing it.

MR. WATSON: I would like to put that undertaking on the record, Mr. Chairman.

MR. B. CAMPBELL: I can't believe that for the second time in this panel I am volunteering an undertaking, but clearly there is going to be interest in.

In dealing with this matter I am quite prepared to say that we would file the 1991 NUG plan, and if my friend can look at the information that Mr. Brown indicates is going to be in there, and if he has any further questions, if speaks to me about it we will do what we can.

THE CHAIRMAN: I think this information would be of great interest, so if it could be produced in some fashion.

MR. B. CAMPBELL: Yes.

THE REGISTRAR: That will be undertaking No. 322.21.

---UNDERTAKING NO. 322.21: Ontario Hydro undertakes to provide the 1991 NUG plan.

MR. B. CAMPBELL: Mr. Chairman, I am sure Mr. Brown and Mr. Vyrostko will bear all this in mind when they get off the stand and can actually prepare

this document.

MR. WATSON: Q. You just told us a few minutes ago, Mr. Snelson, that in looking at the Figure 4-1 the CO_2 numbers were a thousand times larger than we see them on that graph. It's certainly possible that in the future limitations on CO_2 emissions will be in place in this province; isn't that fair?

MR. SNELSON: A. I couldn't speculate on that.

Q. Mr. Snelson, isn't it true that in 1987 there was a protocol signed in Montreal dealing with CO_2 emissions?

A. In which year?

Q. 1987, I believe. It's called the Montreal protocol dealing with the CO_2 emissions?

A. Not to my knowledge.

Q. If there was such a protocol signed, do you feel that it would be of significance and could it possibly indicate that in future CO_2 emissions would be in place?

A. I am very puzzled because if there was such a protocol I am pretty sure I would know about in.

DR. CONNELL: I think the Montreal protocol was chlorofluorocarbons.

MR. WATSON: Q. Is it fair to say that CO(2) is a topic that is attracting attention? NUGs contribute to CO(2), and the possible regulation of CO(2) in the future could have a dramatic affect on NUG potential?

MR. SNELSON: A. Certainly CO(2) is attracting increasing attention.

If you refer to Exhibit 40, which is Ontario Hydro's report, task force on the greenhouse effect, then on page 15 of that -- sorry, not 15 -- page 8 of that report there is a figure which shows the proportions of carbon dioxide produced by different generating technologies for a kilowatthour of electricity. And natural gas-fired cogeneration for a well-balanced cogeneration scheme has about one-third of the carbon dioxide emissions of a coal-fired plant, and is, in fact, the least carbon dioxide emissions of any thermal generating process.

So it's hard to know whether any move towards carbon dioxide regulation is going to increase the pressure for cogeneration or not.

Q. Mr. Snelson, you mentioned that steam injection might be used to reduce NOx emissions. And you are currently assuming that SCR equipment, that's selected catalytic reduction equipment, would not be

necessary; is that fair?

A. The assumptions on NOx control technologies in general is a matter that will be discussed by Panel 8.

Q. So, the effect of this type of equipment, its costs and how that would apply to NUGs, would be dealt with in Panel 8?

A. It will certainly be dealt with in Panel 8 as it applies to combustion turbine equipment that might be used either as combustion turbines, combined cycle or integrated gasification combined cycle, and the technology is also similar to that which is used in a cogeneration, combined-cycle cogeneration scheme.

Q. Mr. Brown, is it fair to say that the majority of NUGs will not be located in the most preferable areas?

THE CHAIRMAN: The most what areas?

MR. WATSON: The most preferable areas.

You recall that Hydro produced map showing the high preference areas, their least preferred areas.

THE CHAIRMAN: Right.

MR. BROWN: I think if you look at the most preferred area, which is Toronto, there is not a

lot of cogeneration opportunity or small hydro in that area. A lot of the opportunity is in northeastern Ontario and some in eastern Ontario. There are pockets of preferred areas in those areas.

MR. WATSON: Q. So by and large, they won't be in the most preferred areas, save for those pockets that you mentioned?

MR. VYROSTKO: A. I think in general up to this date they have been in the preferred areas.

Q. I am looking at page 75 of Exhibit 340, Mr. Vyrostko, it looks as though the most preferred areas are the ones that are surrounding urban centres, Toronto, Kitchener, London, Windsor, Sudbury, North Bay, Ottawa. Is it your evidence that most of the NUGs are in those areas?

A. We have stated that there is a number of NUGs situated around the North Bay area, the northeastern region. There is a number of them around the Ottawa area that have been installed or are in the process of being installed.

One of the new large projects recently announced is the McDonnell Douglas project in Toronto, in Mississauga, which is in that area.

So a number of them are in those areas.

Q. And what sort of megawatt total, are

you talking more than half of the NUGs?

MR. BROWN: A. I would say that of all the NUGs we have to date, the ones in service, the ones committed and the ones that have accepted rate offers, all have been able to go in spots on the transmission system which would imply that at least two-thirds of our 3,100 is in preferred areas.

Q. And of course in your statement you said those in-service as well and that's going to include things like the huge Dow unit in Sarnia which is now classified as a least preferred area.

A. No, I am not including that. That's historical load displacement. I am just talking about our NUG plan which doesn't account for that 1,200.

There is about 2,000 megawatts if you had the rate offers and in-service, and all of those will be incorporated into the system. What is left is the final 1,000 by the year 2000 and some of those may not be in preferred areas.

Q. So about two-thirds of them you are saying will be in the preferred areas, and that's, as the map indicates, near the larger population centres?

A. This is based on some of those already going in-service. There could be some in the Timmins area that at the time were preferred or

information was available.

I was told Timmins is also a preferred area.

Q. Panel, if you could turn to page 80 of Exhibit 340. That's an excerpt from Exhibit 249 which is the Ontario Ministry of Energy staff discussion paper entitled "Potential for Energy Conservation and Carbon Dioxide Reduction in Ontario", it's dated June 1991. We referred to an excerpt from that this morning, I believe.

If you look down to the second last paragraph, talking about recycled paper, and I would like to continue on from a discussion we had this morning, Mr. Brown. You will notice that we are talking about the pulp and paper industry in this segment. The first sentence indicates that use of recycled fibre can lower energy intensity per tonne of newsprint by as much as 70 per cent compared to ground wood pulping methods.

Is it fair to say that the switch to recycled newsprint could have the potential to reduce the steam demand for those plants that switch?

A. I think there is based on this an opportunity that there would be reduced steam production for those people that incorporate recycled

print, but it also opens up the opportunity for new steam hosts like the Atlantic Packaging in Whitby where it's a brand new plant, a brand new steam load which has a new cogeneration opportunity.

Q. Two things. First of all, with respect to the plant in Whitby, that would be less steam per unit of output; isn't that fair, because of lowered intensity?

A. Well, that's a pure recycling plant. I don't know how it would compare. Based on this information it would be definitely less than virgin wood in producing the same amount of paper.

Q. That's for the new plant.

Now, for the old plants we were discussing the problems the pulp and paper industry is facing, and it looks as though they have two choices, they can either convert to the low intensity methods or they are faced with an unfortunate choice of maybe going out of business. Either way your steam load, steam capacity is reducing; isn't that fair?

A. That may be a short-term view. I think in the long term you can only recycle paper so many times before it's of no use even to recyclers.

You still have to provide virgin wood into the market for producing pulp and paper and that's

the advantage Canadian manufacturers have over U.S. counterparts. So, it would be very speculative to say that we are going to see a large decrease in this area.

Q. But despite that advantage, they are still suffering today.

A. There are a lot of industries suffering today.

Q. In particular the pulp and paper industry.

A. Yes, they are. Some of that is environmental as well as recyclable.

Q. And that's not a short-term problem?

A. They are working on that. It's a long-term solution.

MR. VYROSTKO: A. Could I just maybe add one point to what Mr. Brown was saying?

I think it is also referenced on this page, and which is the last bullet point, which talks about one of the other opportunities that's available for the pulp and paper industry and that is improving efficiency through combustion heat recovery.

One of the things that we are trying to do with pulp and paper industry, if they are not prepared to go into a newer technology, is to work with the cogen side.

In fact, one of the issues that we have seen with some of the companies here in Ontario is pressure from their American counterparts to in fact move towards cogen, which is a very common element in the United States.

So therefore, even though they are finding difficulties with some of the existing facilities, cogeneration helps them from an overall energy efficiency perspective.

[2:55 p.m.]

Q. If you turn the page, Panel, to page 81 of Exhibit 340, that is an excerpt from Exhibit 250 entitled "Degrees of Change: Steps Toward an Ontario Global Warming Strategy", and that was filed by the Government earlier in these proceedings.

If you look at the second paragraph at the top of that page, the one starting:

> Cogeneration has an advantage over conventional thermal generating plants because of its ability to exploit waste heat created in the production of electricity, thereby improving overall cycle efficiency.

Now, if we could look at the second sentence:

> In addition, electrical transmission

losses, approximately 7 to 10 per cent, are eliminated since the cogeneration facilities are located at the point where electricity is required.

Now, in fairness, it is not accurate to state that cogeneration will always supply energy only at the site of the facilities, and that is even more so with the over-sized cogen plants that you are considering; isn't that fair?

A. That's correct.

Q. And, Mr. Brown, this morning we were having a discussion about what percentage of NUG capacity was assumed to be load displacement at the site of the facilities, and the 1990 figure I believe was 25 per cent based on 2,100 megawatts, and you indicated while the percent would decrease the amount of megawatts would stay the same. Do you recall that?

MR. BROWN: A. That's true, but that is a contractual definition, load displacement versus purchase. It still could be a purchase project and be located right at the load centre. It is just that it is a third party development.

Q. In any event, it's certainly fair to say that cogeneration represents much more than the 25 per cent or whatever the lower per cent would be of NUG

capacity?

A. Cogeneration is probably the most significant portion of the NUG plan.

Q. And so that statement that it would eliminate transmission losses isn't completely accurate, is it?

MR. SNELSON: A. We expect that it would reduce transmission losses but by a lesser amount than the 7 to 10 per cent indicated.

Q. The next sentence also talks about substantial savings and land use. I assume the same considerations would apply there?

A. I am not sure what land use they are referring to in this, whether they are referring to the land use of the generating station sites or land use for transmission lines.

Q. I think if you continue on the last sentence talks about requiring massive land rights-of-ways for the transmission lines.

So assuming that they are talking about savings in land use because you don't need transmission lines, and that seems to be the thrust of the paragraph, two points: one they are not eliminating transmission losses; and two, there will be land required for transmission facilities, especially with

the over-sized cogen; isn't that correct?

A. If they reduce the need for transmission, they should reduce the need for transmission lines, and to the extent that that reduces the need for new rights-of-way then it would reduce the land use.

I think the discussion of transmission rights-of-way and whether that is a massive land use would perhaps be better held for Panel 7.

Q. And, Panel, we have been talking about emissions, but there is another issue with respect to NUGs as well as far as the environment is concerned. NUGs are not currently subject to the same environmental assessment process that we find ourselves involved in today; isn't that correct?

MR. VYROSTKO: A. Non-utility generators as well as Ontario Hydro are subject to the Environmental Assessment Act, but the process of getting approval is different between the utility and the NUGs, except -- and the only place where it would be similar would be when the Minister so elects to make them the same.

Q. Well, if Hydro was going to put up a 350 megawatt major supply gas-fired facility they would require an environmental assessment; isn't that

correct?

A. The question was if Ontario Hydro had to do that?

Q. Yes.

A. I believe it would.

Q. And the 350 megawatt major supply NUG that you have been referring to is not going to require an environmental assessment hearing, will it?

A. I don't know that at this stage. It may or may not.

Q. Do you have any indication that it's going to require one?

A. To this date, I do not.

Q. Now, in future isn't it possible that the major supply NUGs might be subject to environmental assessments?

A. Yes, it's possible.

Q. And that is not reflected in your forecast, is it, Mr. Brown?

MR. BROWN: A. No, it's not. By using the current regulations.

Q. Panel, in the 1990 plan you assumed a retirement rate of two megawatts per year and in the 1989 NUG plan you assumed a retirement rate of 17 megawatts per year; is that correct?

A. That's correct.

Q. And this retirement rate does not necessarily correspond to the 30-year life assumed for cogeneration; isn't that correct?

A. Retirement rate in 1989 NUG plan was developed assuming a three per cent retirement rate based on the 1,600 megawatt forecast.

When we did the 1990 NUG plan we went back and looked at historical information and found out that it wasn't that high, that over the last I think 20 or 30 years that it has been averaging only two megawatts per year, which is the number we used in the 1990 NUG plan.

Q. So at two megawatts per year the retirements by the year 2001 would be 20 megawatts. It is a straight linear relationship; isn't that correct?

A. That's correct.

Q. Panel, I have prepared an exhibit, which is entitled "Age of Existing Non-Utility Generation Sites". And, Mr. Lucas, if I could have a number for that, please?

THE REGISTRAR: That will be No. 342.

---EXHIBIT NO. 342: Document entitled, "Age of Existing Non-Utility Generation Sites".

MR. WATSON: Q. Panel, this was prepared

based on Interrogatory 5.14.230, and perhaps you can accept the figures subject to checking them in the interrogatory, and if there is some error you can advise us.

THE REGISTRAR: That will be No. 321.54.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.54: Interrogatory No. 5.14.230.

MR. WATSON: Q. Now, in looking at this table we see that there are currently 59 megawatts which are more than 30 years old, and that is the sum of the megawatt -- the first three figures in the megawatt column: 4, 39 and 16.

It also shows that there are 300 megawatts of existing NUGs which were built in the '60s, and these sites are 20 to 30 years old, and by the year 2000 these sites are going to be more than 30 years old. I take your evidence to be that you feel only 20 megawatts of this will retire by the year 2000, but isn't it possible that there could be a greater amount than this that retires by the year 2000?

MR. BROWN: A. Our estimate of "retirement" is that the facility is aged, it is used, and there is not -- that potential is not used again. So it is a full retirement.

There is opportunity, if a site is

retired, that another cogeneration plant could be built in the same location or even a larger cogeneration plant.

So in our forecast of "retirement" is that there is no redevelopment of that site.

Q. I guess, Mr. Brown, it would be fair to say that when you are looking at NUG retirement you haven't had a lot of experience. There just hasn't been a lot, has there?

A. Due to their age there is not that many that retires -- retirements. It has been filed in a NUG plan the year-by-year retirements that we have been aware of, and that's how we got the two megawatts per year, and in Interrogatory 5.32.9, which is a list of all NUGs in-service and committed, there is a small section in there of known retirements over the last several years.

THE REGISTRAR: That will be number 321.55.

MR. BROWN: I believe that should be filed. 5.32.9? No?

THE CHAIRMAN: I don't see it off hand. I haven't got a complete list.

THE REGISTRAR: 321.55.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 321.55: Interrogatory No. 5.32.9.

MR. WATSON: Q. Panel, if you could turn to the last page? That's at page 84 of Exhibit 340. We have prepared a list entitled "Factors Leading to NUG Forecast Uncertainty".

Now, in the course of your evidence, both direct and cross, we have gone through a number of these now.

I don't propose to go through these again. They are just there in front of you. What I would ask you to do, though, is look at that list and could you tell me whether there are other factors affecting uncertainty that I have not mentioned on this list?

THE CHAIRMAN: I take it this is your own list and it is not sourced from anywhere; is that right?

MR. WATSON: That is correct, Mr. Chairman. This is a list that we prepared. It would be sourced from the evidence, the documentation, everything we have been able to put our hands-on.

MR. BROWN: I may want to add -- the only one I can think of is the area of alternate technologies and uncertain -- plus and minus.

[3:10 p.m.]

Q. Thank you. Now in looking at this list, it's fair to say that Hydro can't change many of these factors? Would you agree with that, Mr. Brown?

A. I think there are some that we can and some that are outside our control.

Q. Is it fair to say that there would be more certainty involved if Hydro were to build its own supply sources in comparison to NUG sources?

MR. SNELSON: A. I think it's very hard to make a judgment in that regard. There are uncertainties in both ways of acquiring generation.

Q. Now, Mr. Brown, the 1989 NUG plan provided what Hydro called a range forecast to reflect the uncertainties. I understand the 1990 NUG plan did not provide a similar range forecast, is that correct.

MR. BROWN: A. That's correct.

Q. Will the 1991 NUG plan include a range forecast?

A. No, it will not.

Q. Now, while you did not provide ranges for the 1990 forecast, and don't anticipate it for the 1991, were they produced?

A. No. I believe the '89 one was done specifically for input into the Demand/Supply Plan, and when we did the 1990 and working on the '91 plan, we

did not incorporate upper and lower forecast in the NUG plan.

Q. With the levels of uncertainty that we have in this area, wouldn't it be more appropriate to plan around a range?

A. I think there is uncertainty plus and minus, which is why we do a sensitivity analysis within the plan. I know there are other upper and lower forecasts based on a particular variable like high load growth or some scenario. For NUGS there are many variables that you could have upper and lower scenarios, such as gas price, capital cost. Because of that we just provide the one, our best guess forecast.

Q. As Mr. Brown, said there are a lot of uncertainties with respect to NUGS. We spent a lot of time in Panel 1, dealing with all of the uncertainties associated with the basic load forecasts. It would seem to me that there are a lot more uncertainties associated with that.

MR. B. CAMPBELL: I don't think anyone on this panel can comment on the Panel 1 evidence.

MR. WATSON: I wasn't trying to suggest they could, Mr. Chairman. Mr. Brown made the point that there were a lot of uncertainties associated with the NUG forecast. Some could affect it in a high way,

some in the low, and I was simply trying to point out that as Hydro does a basic load forecast, there are many more uncertainties involved.

Q. I was just wondering whether, in fact, there is another answer, a better answer as to why they are not doing one in the NUG forecast.

MR. BROWN: A. If I may just go back with a little bit of history? The 1989 forecast was a very first NUG forecast. There were very few utilities that forecast NUGs at all. As we start progressing and providing more and more forecasts we will have the history that the load forecast does behind them of having 60 years of data in forecasting, and I believe one day the NUG forecast will be in a position and have more information to do upper and lower scenarios.

Q. Mr. Brown, if you don't have the data, isn't that more of a reason to do a range? For instance, dealing with Panel 1, you use an econometric forecast based on a mathematical econometric model. Now, isn't what you have said an argument for having a range forecast reflecting the uncertainty and the lack of data?

MR. SNELSON: A. I believe that part of this question really relates to what purpose you're going to use the forecast, and how it's going to be

used, and the overall assessment of uncertainties in the plan as a whole is something we do when we put the whole plan together -- that's a planning issue, and we will testify on that on Panel 10.

We specifically as users of that information in planning did -- an upper and lower scenario is where well we looked at upper and lower estimates with a number of inputs for the Demand/Supply Plan, and that was the purpose for which those upper and lower scenarios in the '89 plan were prepared.

When we're coming to assess the overall uncertainties of the plan we have to say which are the biggest uncertainties that we face? We make judgments as to which ones we'll deal with in some analytical way and which ones we'll deal with in some judgmental way.

Q. Mr. Snelson, I don't want to get too far into this, and I certainly don't want to get into Panel 10 issues.

Hydro has told us that they're going to rebalance the plan. In the course of doing that rebalancing, wouldn't it be useful to know what sort of range of NUGs they can expect?

A. In the rebalancing exercise we'll have to consider the various risks that we face, and how we will deal with them, and which ones we'll deal

with analytically, and which ones we'll try and deal with judgmentally.

Q. But you're not going to have a range?

A. I don't know that we'll have a range at this time.

Q. Two points, panel, before we finish.

First, looking at what the situation is today, we have very low gas prices; we have low interest rates; we have a number of advantages extended to NUGs, such as Class 34 premiums, programs both by Hydro and the government, high avoided cost, project appraisals, system incremental costs that we have discussed and I think it's fair to say that all adds up to what you have called "a window of opportunity".

Now, when you add to that in the future that you are forecasting, and I guess other people are forecasting increased gas prices, it seems to me that this is now the perfect time for NUGs, and my question to you is if any projects are not being pursued now, what makes you think they would be pursued in the future?

MR. VYROSTKO: A. One of the projects, or one of the types of projects that may not be pursued now, but could be in the future, is the ones we talked about today and yesterday with respect to the steam

host, and the economic situation facing the steam host.

A number of the industries will have various cycles, up and down cycles, and so even though today the environment is positive for some of the projects because of low gas, low interest rates, some of the industry may not be ready for that because they have problems with their own market sector and whether, in fact, they're making money or not, like the pulp and paper industry or the steel industry today.

Three or four years down the road they may be in the reverse situation where they have recovered and they now have money, capital dollars to invest, and they see the need for energy efficiency and cogeneration and so they would be moving in that direction at that time, and so there are some types of businesses that would be moving towards cogeneration whether we have this window of opportunity or not.

[3:20 p.m.]

Q. And outside of cogen?

A. Now, we are looking at in small Hydro, for instance, because now we are dealing with other technologies, small hydro may improve down the road. As the industry gets a class EA document which then helps the proponents to move forward, and so that might open up opportunities there.

Alternate technologies down the road might become a lot more viable as a result of either changing technologies or economies of scale as costs come down.

So, there are other windows of opportunity for other types of technologies.

Q. Finally, panel, as you know, my client strongly feels that the quality of electricity service is of fundamental importance. Now, if we could assume for a minute that we move to a situation where you are not achieving your NUG objectives sometime in the future, can you assure the MEA that the quality of electricity service will not be diminished in that situation?

MR. SNELSON: A. Reliability of supply to customers can go down due to a wide number of reasons which we try to minimize, but they can go down because loads are higher than forecast. They can go down because our own generation program gets delayed or otherwise upset.

There is a whole list of things which we rely upon to provide reliable supply. We provide reserve margins and so on to protect against these things, but if in accumulation they lead to a greater reduction in supply or greater increase in demand than

we have allowed for, then there can be diminution in reliability of supply until we can correct the situation.

MR. WATSON: Mr. Chairman, those are my questions for today. As I indicated before and during the cross-examination, there are a number of areas that appear to be affected by what is going to happen tomorrow, and I would ask that I be allowed to come back and continue my cross-examination at a later date dealing with those areas.

THE CHAIRMAN: That arise out of the change in policy that announcement may engender.

MR. WATSON: That's correct. I don't want to come back and deal with whole new areas. You recall several times today and yesterday, for instance, in dealing with project appraisal avoided cost Mr. Vyrostko suggested that there might be something that I would be interested in tomorrow, and also with respect to major supply NUGs.

THE CHAIRMAN: Of course it may be that when you revisit it, it will also be clear and understandable that you won't need to do that.

MR. WATSON: That's possible as well, Mr. Chairman. I would just simply like to reserve right.

THE CHAIRMAN: That is fine.

MR. WATSON: Thank you. Those are my questions.

THE CHAIRMAN: I suspect that others who have already examined will the want to do the same thing.

Is there anything else that we need to do before we adjourn?

We are going to adjourn then until a week Monday, which is the 28th of October, at ten o'clock, and we will continue with the cross-examination of this panel.

MR. B. CAMPBELL: Mr. Chairman, if I could just record that we have now copies in response to an undertaking, Exhibit 322.11, which is a document entitled "Wood Waste Generation and Management in Ontario", April 1991, I believe that was an undertaking given to IPPSO in the course of its cross-examination, and it has now been filed and copies are available for those who wish it.

THE CHAIRMAN: It is possible also, and perhaps even likely, that we may want to on the 28th continue the discussion with respect to the hydraulic Panel 6.

MR. B. CAMPBELL: Yes. As I understand it, I remain under an obligation to kind of report back

at that time and I will be prepared to do so. What I will have to say heaven only knows, but presumably I will by that time.

DR. CONNELL: Are the revised IPPSO questions now available?

MR. WATSON: Yes, they are, Dr. Connell.

DR. CONNELL: I would like a handy definition of simultaneous buy/sell. I recognize Mr. Vyrostko said terms and conditions remain to be established, but if you could just give me some rough definition of the perimeter of simultaneous buy/sell, I would be grateful.

MR. VYROSTKO: Including the definition, Dr. Connell?

DR. CONNELL: Yes.

MR. VYROSTKO: Simultaneous buy/sell, in essence, is when a developer puts a project, typically a generating station, on a site where there is an existing customer, and rather than the customer billing that facility and therefore the customer using the electricity from that generating station to displace the existing electricity he would buy from Hydro, you in fact have a generating station that sells separately to Ontario Hydro while the customer continues to buy electricity from Ontario Hydro.

So, in essence, it's two distinct transactions at the same site: A generating station that sells to Ontario Hydro or to the utility, and the existing facility that uses electricity and therefore buys electricity from a local utility or Ontario Hydro.

DR. CONNELL: And this can include cogen?

MR. VYROSTKO: Oh, yes. In most cases that's what it is, because the steam host is already an existing customer and therefore is already buying electricity from the utility.

THE CHAIRMAN: Do you have any further questions?

MR. WATSON: No, Mr. Chairman.

THE CHAIRMAN: We will now adjourn.

THE REGISTRAR: This hearing will adjourn until 10:00 a.m. Monday, October the 28th.

---Whereupon the hearing was adjourned at 3:30 p.m. to be resumed on Monday, October 28, 1991, at 10:00 a.m.

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